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The Health and Wellness course has been divided into two parts: - Health, Lessons 1-15, and Nutrition, Lessons 16-30.

Each topic lesson has associated activities and evaluation materials.

## Health 9

### UNIT I - The Respiratory System

Many Air Combinations  
Mechanics of Breathing

Lesson 1

Diseases and Disorders of the Respiratory System

Lesson 2

### Lessons 1-15

The Structure of the Circulatory System  
The Composition of Blood

Lesson 3

Function of the Circulatory System  
Protection of the Circulatory System

Lesson 4

Diseases and Disorders of the Circulatory System

Lesson 5

First Aid and Nursing  
Medical Advances

Lesson 6

### UNIT II - The Nervous System

Man's Marvelous Control System

Lesson 7

Diseases and Disorders of the Nervous System

Lesson 8



**Distance  
Learning**

**Alberta**  
EDUCATION

Health 9  
Student Module  
Lessons 1-15  
Alberta Correspondence School  
ISBN No. 0-7741-0449-X

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## HEALTH and GUIDANCE

Grade 9

Introduction

The Health and Guidance course is a thirty-lesson course which has been divided into two parts, -- Health, Lessons 1 - 15, and Guidance, Lessons 16 - 30.

Send in one lesson each week unless you are otherwise instructed.

### Course Outline in Health

#### UNIT I - The Respiratory System

Man's Air Conditioner	Lesson 1
Mechanics of Breathing	
Diseases and Disorders of the Respiratory System	Lesson 2

#### UNIT II - The Circulatory System

The Structure of the Circulatory System	Lesson 3
The Composition of Blood	
Function of the Circulatory System	Lesson 4
Protection of the Circulatory System	
Diseases and Disorders of the Circulatory System	Lesson 5
First Aid for Bleeding	Lesson 6
Medical Advances	

#### UNIT III - The Nervous System

Man's Marvellous Control System	Lesson 7
Diseases and Disorders of the Nervous System	Lesson 8

#### UNIT IV - The Endocrine System

The Glands and Their Functions	Lesson 9
Diseases and Disorders of the Endocrine System	

Grade 9

**HEALTH and GUIDANCE**

Introduction

**UNIT V - Safety on Wheels and on Water**

Safety on the Highway	Lesson 10
Keeping Your Car Safe The Expert Driver	Lesson 11
Safety on the Water	Lesson 12

**UNIT VI - Group Action for Health**

Community Health Problems Health Services in Your Community	Lesson 13
Other Health Services	Lesson 14

**TEST**

Lesson 15

## How to Succeed

You have shown that you are an achiever, that you are a rather exceptional person, as you have chosen to study by correspondence. You have discovered an alternative form of learning which many students feel is highly appropriate for them. You may believe as they do that correspondence study is closer to the preferred form of learning than traditional classroom instruction.

Now that you have indicated you want to learn by correspondence, we want to do all we can to help you succeed. Correspondence study has one thing in common with any other skill you might like to learn — from basketball to computer technology — it takes regular practice and guidance from a coach to help you achieve your goals. If you work on your course regularly, you will get the practice you need and, if you submit your lessons regularly, you will get any assistance you need from your teacher.

You will find the course work easier if you set aside some time each day for study and you attempt only part of the lesson at each session. Try to finish one lesson in the course each week and send the lesson for correction as soon as you have finished it.

If you follow these suggestions your correspondence teacher will have ample time to help you and you will be more likely to succeed in your studies. Start your course right away, today, and keep working on it until you reach your goal. You will find you will need determination and perseverance, but with support from your teacher and from your family and friends, you will be successful in your correspondence studies.

We at the Alberta Correspondence School will do all we can to help you achieve your learning objective. Write to us or call us at 674-5333 if you need any special help with your course work.



Garry Popowich  
Director

Health and safety is the care and protection of people and goods used in the workplace or environment. It is the protection of people from risks to their health and safety caused by work activities. Lesson 13 will focus on your responsibility as a student to stay safe and make informed decisions about your health and safety.

Imagine the following types of risks you encounter every day at school or home. Do the following questions help you to identify what you can do to stay safe?

- What are some ways to prevent falls?
- What are some ways to prevent fires?
- What are some ways to prevent drowning?
- What are some ways to prevent food poisoning?
- What are some ways to prevent injuries from sharp objects?

### Other Health Services

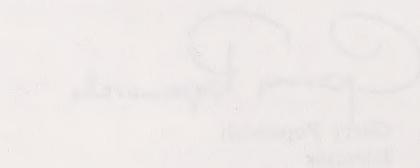
Another type of health service

Lesson 14

Tell your class what other services you think there are. If you have access to a local library, look there for more information. Lesson 14 will teach you how to stay safe from the sun, how to stay safe from cold weather, and how to stay safe from mold.

Some school health services provide services such as dental, vision, and hearing tests. In addition to these, many schools also provide services such as first aid, mental health services, and guidance services. These services help students deal with challenges such as stress, anxiety, depression, and other mental health issues.

Students can also receive services such as nutrition services, which can help them eat healthy, exercise, and stay active. These services can also help students manage their mental health and reduce stress.



Ontario Ministry of Education  
Student Health and Well-being  
Student Health and Well-being

**A LESSON RECORD FORM MUST BE COMPLETED FOR EVERY LESSON  
SUBMITTED FOR CORRECTION, AS ILLUSTRATED BELOW**

A Lesson Record form with the **correct** label attached **must** be enclosed with **every lesson** submitted for correction, as illustrated below.

Correct use of these labels will ensure prompt processing and grading of your lessons.

The enclosed **Lesson Labels** must be checked for spelling and address details.

Please advise the Alberta Correspondence School promptly of any changes in name, address, school, or any other details and we will issue a revised set of labels. Your file number is permanently assigned and **must** be included on all correspondence with the Alberta Correspondence School. If the proper label and Lesson Record Form is not attached to each lesson as indicated it will delay your lessons being processed and credited to you.

Lesson labels are to be attached to the **lesson record forms** in the space provided for student name and address.

Check carefully to ensure that the **subject name**, **module number** and **lesson number** on each label corresponds exactly with the lesson you are submitting.

Labels are to be **peeled** off waxed backing paper and **stuck** on the lesson record form.

Only **one** label is to be placed on each lesson.

LESSON RECORD FORM

FOR STUDENT USE ONLY		FOR SCHOOL USE ONLY	
Date Lesson Submitted	(If label is missing or incorrect)	Assigned Teacher:	
Time Spent on Lesson	File Number	Lesson Grading:	
Lesson Number _____		Additional Grading E/R/P Code:	
Student's Questions and Comments		Mark:	
Course Name and Number		Graded by:	
Student File Number		Assignment Code:	
Bar Code (same information as above)		Date Lesson Received:	
		Lesson Recorded:	
Please write the <b>proper</b> label for correct class, subject and lesson			
Teacher's Comments:			
Correspondence Teacher			

Lesson Number →

Module Number (if applicable) →

Course Name and Number Student File Number →

Bar Code (same information as above) →

Student name and Address →

When revised labels are received, place the **correct new labels** on your Lesson Record Forms.

LESSON →

MODULE →

FILE NUMBER COURSE NAME →

NAME ADDRESS →

**DO NOT MARK OR COVER BAR CODING.**

**CHANGE OF ADDRESS**

If the address on your lesson record form differs from the address you supplied on your registration application, please explain. Indicate whether the different address is your home, school, temporary or permanent change of address.



**LESSON RECORD FORM**

0905 Health 9

Rev. 88/04

**FOR STUDENT USE ONLY**Date Lesson Submitted  
\_\_\_\_\_(If label is missing  
or incorrect)Time Spent on Lesson  
\_\_\_\_\_File Number  
\_\_\_\_\_

Lesson Number \_\_\_\_\_

**Student's Questions  
and Comments****Apply Lesson Label Here**

Name	Address				Postal Code
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*Please verify that preprinted label is for  
correct course and lesson.***FOR SCHOOL USE ONLY**Assigned  
Teacher: \_\_\_\_\_

Lesson Grading: \_\_\_\_\_

Additional Grading  
E/R/P Code: \_\_\_\_\_

Mark: \_\_\_\_\_

Graded by: \_\_\_\_\_

Assignment Code: \_\_\_\_\_

Date Lesson Received:  
\_\_\_\_\_

Lesson Recorded \_\_\_\_\_

**Teacher's Comments:**

## **ALBERTA CORRESPONDENCE SCHOOL**

### **MAILING INSTRUCTIONS FOR CORRESPONDENCE LESSONS**

#### **1. BEFORE MAILING YOUR LESSONS, PLEASE SEE THAT:**

- (1) All pages are numbered and in order, and no paper clips or staples are used.
- (2) All exercises are completed. If not, explain why.
- (3) Your work has been re-read to ensure accuracy in spelling and lesson details.
- (4) The Lesson Record Form is filled out and the correct lesson label is attached.
- (5) This mailing sheet is placed on the lesson.

#### **2. POSTAGE REGULATIONS**

Do **not** enclose letters with lessons.

**Send all letters in a separate envelope.**

#### **3. POSTAGE RATES**

First Class

**Take your lesson to the Post Office and have it weighed. Attach sufficient postage** and a green first-class sticker to the front of the envelope, and seal the envelope. Correspondence lessons will travel faster if first-class postage is used.

**Try to mail each** lesson as soon as it has been completed.

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## HEALTH and GUIDANCE

## Unit I • The Respiratory System

The special system in the body that takes oxygen from the air and makes it available to all the cells in the body is the respiratory system. This system is a series of tubes and passages through which air travels to microscopic air sacs in the lungs. From the air sacs oxygen enters the blood stream.

The organs that supply the body with air make up the respiratory system. These organs require special protection because they are subject to some of the most frequent and most dangerous diseases and disorders.

## Man's Air Conditioner

## A. The Nose

The nose, a much larger organ than that which you see on the face, contains many chambers, separated by thin partitions. These chambers stretch over a good part of the front of the skull. The nasal cavity is divided by a thin partition of bone and cartilage called the septum. In the middle portion of each lateral wall of the septum are three bony projections called turbinates which divide each nasal cavity into three passageways. These nasal passages and the four pairs of sinus cavities are all lined with a moistened membrane. This membrane, richly supplied with blood vessels, moistens and warms the incoming air as it circulates from one chamber to another on its way to the lungs. Cilia, fine hair-like projections of membrane, line the nasal passages and filter particles of dust and soot from the air. Can you see why it is better to breathe through the nose than through the mouth?

## B. The Pharynx

The pharynx collects incoming air from the nose and mouth and passes it downward to the trachea (windpipe).

## C. The Larynx

The larynx, which is the voice box, connects the pharynx with the trachea. The greater the amount and force of air passing from the lungs through the larynx, the louder the voice. Pitch variations result because of tension in the vocal cords. The larger the larynx and the longer the vocal cords, the deeper is the voice.

## HEALTH and GUIDANCE

When a person swallows, the epiglottis, a leaf-like lid, covers the glottis, the upper opening of the larynx, so that food and water may not enter it. However, if you try to talk and eat at the same time, food may go down the wrong tube. Strong muscles then make you cough to expel the food.

### D. The Trachea and Its Branches

The trachea (windpipe) is a tube about four and one-half inches long and one inch in diameter. The trachea extends from the bottom of the larynx through the neck and into the chest cavity. At its lower end the trachea divides into two tubes, the right bronchus and the left bronchus. The two bronchi lead into the lungs.

The trachea and bronchi are lined with cilia, very small hair-like projections, that have a wave-like motion. This motion carries mucus upward and into the throat where it can be coughed up. The mucus catches and holds much of the dust, germs, and unwanted matter that has invaded the lungs.

### E. Bronchial Tubes

Each bronchus divides and subdivides within a lung forming a network of tubes resembling branches of a tree. These divisions are called bronchial tubes. As the bronchial tubes branch and become smaller, their walls become thinner. Each bronchial tube ends in a tiny chamber from which air sacs extend in clusters. These air sacs are called alveoli. A vast network of tiny blood capillaries which penetrates the lungs surrounds each of the alveoli. The thin walls of the alveoli and the equally thin walls of the capillaries permit an exchange of gases between the blood and the air.

### F. Lungs

The right lung is divided into three lobes or sections; the left lung is divided into two lobes. Each lobe is like a balloon filled with sponge-like lung tissue. Air moves in and out of each lobe through one opening. The pleura consists of the two membranes that surround each lobe of the lungs and separate the lungs from the chest wall.

## HEALTH and GUIDANCE

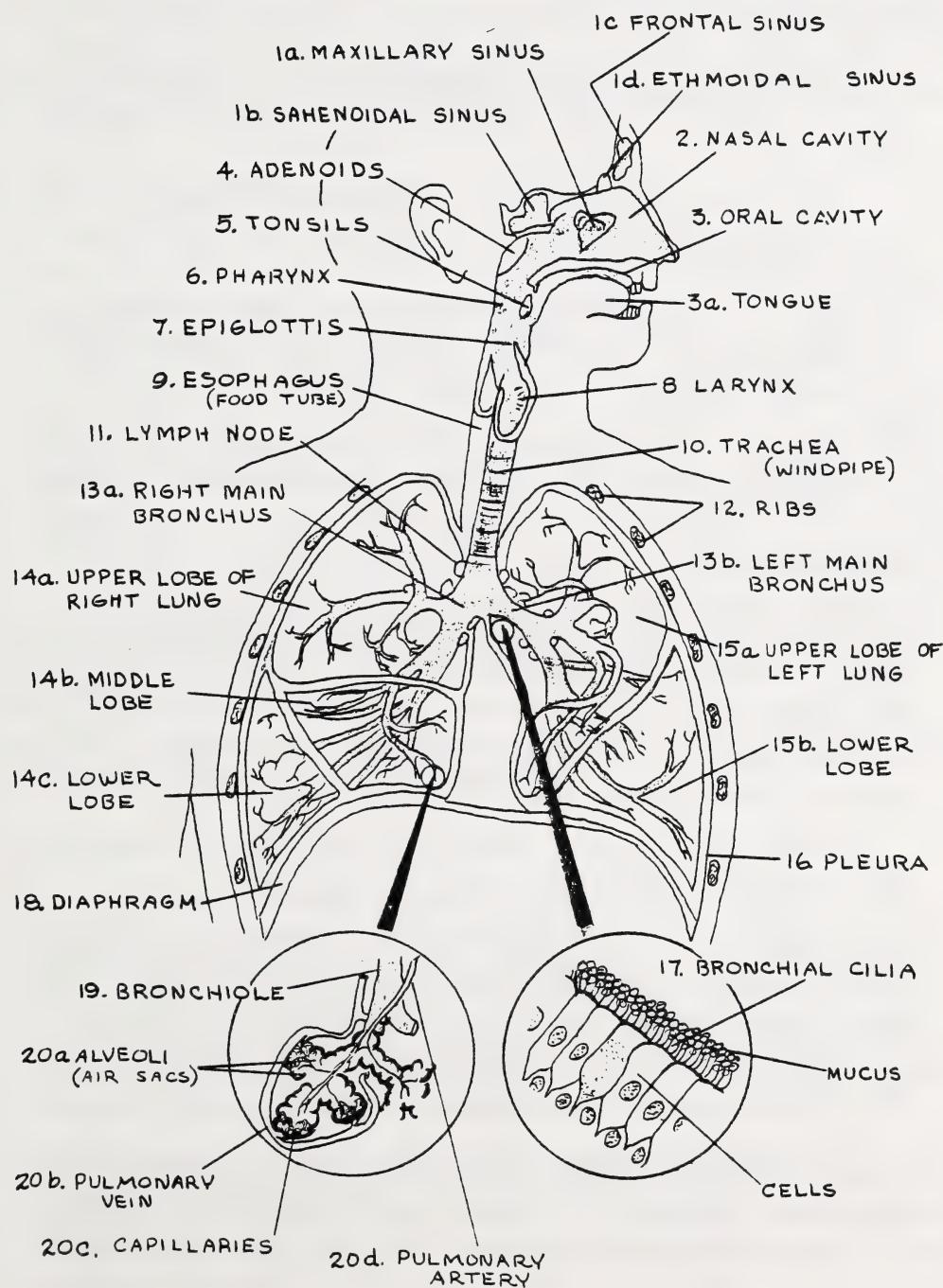
- The chart of the RESPIRATORY SYSTEM shows the apparatus for breathing. Breathing is the process by which oxygen in the air is brought into the lungs and into close contact with the blood, which absorbs it and carries it to all parts of the body. At the same time the blood gives up waste matter (carbon dioxide), which is carried out of the lungs with the air breathed out.
1. The SINUSES (Frontal, Maxillary, Sphenoidal and Ethmoidal) are hollow spaces in the bones of the head. Small openings connect them to the nasal cavity. The functions they serve include helping to regulate the temperature and humidity of air breathed in, as well as to lighten the bone structure of the head and to give resonance to the voice.
  2. The NASAL CAVITY (nose) is the preferred entrance for outside air into the Respiratory System. The hairs that line the inside wall are part of the air-cleansing system.
  3. Air also enters through the ORAL CAVITY (mouth), especially in people who have a mouth-breathing habit or whose nasal passages may be temporarily obstructed, as by a cold.
  4. The ADENOIDS are overgrown lymph tissue at the top of the throat. When adenoids interfere with breathing, they are generally removed. The lymph system, consisting of nodes (knots of cells) and connecting vessels, carries fluid throughout the body. This system helps to resist body infection by filtering out foreign matter, including germs, and producing cells (lymphocytes) to fight them.
  5. The TONSILS, lymph nodes in the wall of the pharynx often become infected. They are an unimportant part of the germ-fighting system of the body. When infected, tonsils are generally removed.
  6. The PHARYNX (throat) collects incoming air from the nose and mouth and passes it downward to the trachea (windpipe).
  7. The EPIGLOTTIS is a flap of tissue that guards the glottis, the entrance to the trachea. This flap closes when anything that should go into the esophagus and stomach is swallowed.
  8. The LARYNX (voice box) contains the vocal cords. It is the place where moving air being breathed in and out creates voice sounds.

## HEALTH and GUIDANCE

9. The ESOPHAGUS is the passage leading from mouth and throat to the stomach.
10. The TRACHEA (windpipe) is the passage leading from the pharynx to the lungs.
11. The LYMPH NODES of the lungs are found against the walls of the bronchial tubes and trachea.
12. The RIBS are bones supporting and protecting the chest cavity. They move to a limited degree, helping the lungs to expand and contract.
13. The trachea divides into the two main BRONCHI (tubes), one for each lung, which subdivide into the lobar bronchi -- three on the right and two on the left. These, in turn, subdivide further.
14. The right lung is divided into three LOBES, or sections.
15. The left lung is divided into two LOBES.
16. The PLEURA are the two membranes that surround each lobe of the lungs and separate the lungs from the chest wall.
17. The bronchial tubes are lined with CILIA (like very small hairs).
18. The DIAPHRAGM is the strong wall of muscle that separates the chest cavity from the abdominal cavity. By moving downward, it creates suction to draw in air and expand the lungs.
19. The smallest subdivisions of the bronchi are called BRONCHIOLES, at the end of which are the alveoli (plural of alveolus).
20. The ALVEOLI are the very small air sacs that are the destination of air breathed in. The CAPILLARIES are blood vessels that are imbedded in the walls of the alveoli. Blood passes through the capillaries, brought to them by the PULMONARY ARTERY and taken away by the PULMONARY VEIN. While in the capillaries the blood discharges carbon dioxide into the alveoli and takes up oxygen from the air in the alveoli.

## HEALTH and GUIDANCE

## THE RESPIRATORY SYSTEM



## HEALTH and GUIDANCE

## Mechanics of Breathing

**A. Respiration**

The procedure, by which oxygen is supplied to the cells and carbon dioxide is removed from them, is known as respiration. Respiration involves three different processes.

1. Breathing includes the action of muscles in getting air into the lungs (inhalation) and in forcing air out of the lungs (exhalation).
2. External respiration takes place when gases are exchanged between air in the alveoli (air sacs) of the lungs and the blood stream. The blood takes on oxygen and gives off carbon dioxide.
3. Internal respiration takes place in every living cell when it exchanges gases with the blood. The cells take in oxygen and give off carbon dioxide.

**B. Rate of Breathing**

The rate of breathing varies considerably in individuals according to age, size, and activity. An infant breathes 40 to 70 times a minute; the average adult about 16 to 18 times a minute. An increase in the carbon dioxide content of the blood acts on the respiratory centre and increases the rate of breathing. Excitement and fear also speed up breathing. Strong feelings increase gland secretions which affect nerves in the respiratory centre.

Slowing down of bodily activity decreases the rate of breathing. During sleep the rate may be only 12 to 13 times a minute.

It might be of interest to note that the length of time a person can hold his breath varies from 25 to 75 seconds. If a person holds his breath, carbon dioxide accumulates in his blood. The carbon dioxide exerts such a strong stimulus on the brain's respiratory centre that the person is forced to breathe again.

**C. Body Adjustments to High Altitudes**

The body must adjust to high altitudes. As a person travels upward, the air becomes thinner and contains less oxygen. Low atmospheric pressure and lack of oxygen cause dizziness and an increase in the rate of breathing.

## HEALTH and GUIDANCE

Newcomers to regions of high altitudes find respiration difficult. People native to these regions seem to experience no difficulty in this respect. These people have made body adjustments. They have acquired more red corpuscles which afford the blood a greater capacity for delivering oxygen to the cells of the body. Many great distance runners come from mountainous areas. These runners have, as you can see, an advantage over runners from low pressure areas.

### D. Respiration Problems in High Pressure Areas

The effect of high pressure on breathing is the opposite to that of low pressure. At low altitudes, the high pressure of the atmosphere tends to push air into the lungs. For this reason extra oxygen is forced into the blood stream. In addition nitrogen is picked up in the alveoli of the lungs. If the person remains in this high pressure area no difficulty is experienced. However, if the person goes to a low atmospheric pressure area too rapidly, the blood releases its extra supply of oxygen and nitrogen. The tissues pick up the oxygen but reject the nitrogen. Because nitrogen cannot pass from the blood to the lungs fast enough it then forms bubbles in the blood (like bubbles of carbon dioxide which appear in soda water). These bubbles block small blood vessels and create a condition referred to as "the bends." The victim complains of nausea, abdominal pains, muscle cramps and dizziness. In more severe cases there is a muscle paralysis and unconsciousness. "Bends" can be fatal.

Deep sea divers and miners are brought to the surface slowly so that "the bends" may be avoided.

### E. Temperature, Humidity, Ventilation

In a poorly ventilated room a person may feel drowsy and listless. At such a time he may feel that he is about to smother. However, there is no need for alarm for there is plenty of oxygen in the air. The problem is not primarily one of respiration. A decrease in the body's cooling system is responsible for his discomfort. The smothering feeling is brought about by three factors. They are an increase in temperature, an increase in the moisture content (humidity) of the air, and a lack of ventilation.

The body temperature usually remains fairly constant at 98.6 degrees Fahrenheit regardless of outside temperatures. On a very hot day temperatures inside the body may be cooler than the outside. Temperatures are equalized by the process of evaporation. Sweat glands work hard to pour perspiration onto the skin where it is

## HEALTH and GUIDANCE

evaporated by the surrounding air. If evaporation of perspiration continues little discomfort is experienced. However, if the air becomes very humid, that is, if the air has already absorbed almost as much moisture as it can hold, very little evaporation of perspiration can take place. The person does not cool off but continues to perspire and he becomes more uncomfortable. High moisture content of air makes a person feel more intensely both the heat in summer and the cold in winter. A damp cold seems to penetrate "the very marrow" of one's bones. This is so because cold moist air absorbs heat from the body at a rapid rate.

Ventilation prevents stuffiness in a room. Air currents increase the movement of air over the skin and speed up evaporation of perspiration. Then, too, ventilation removes objectionable odours.

A room temperature of 16 to 21 degrees Celsius and a relative humidity of 40 to 50 per cent are ideal for comfort and for health.

## HEALTH and GUIDANCE

Exercise 1 Man's Air Conditioner

Answer T (True) if the statement is true; answer F (False) if the statement is false. Use the spaces provided.

- \_\_\_\_\_ 1. Your nose contains many chambers separated by thin partitions.
- \_\_\_\_\_ 2. The nasal cavity is divided by a thin partition of bone and cartilage called the septum.
- \_\_\_\_\_ 3. The turbinates divide each side of the nose into three passageways.
- \_\_\_\_\_ 4. The nasal cavities and sinus cavities are all lined with cilia, and a mucous membrane richly supplied with blood vessels.
- \_\_\_\_\_ 5. The mucous membrane warms and moistens the air as it circulates from passageway to passageway on its journey to the lungs.
- \_\_\_\_\_ 6. The larynx or voice box lies at the bottom of the trachea.
- \_\_\_\_\_ 7. The larger the larynx and the shorter the vocal cords the louder the voice.
- \_\_\_\_\_ 8. When a person swallows, the epiglottis covers the glottis, or upper opening of the larynx.
- \_\_\_\_\_ 9. The trachea extends from the bottom of the larynx through the neck and into the chest cavity.
- \_\_\_\_\_ 10. The bronchi are lined with cilia and a mucous membrane. These help to rid the bronchi of dust and germs.
- \_\_\_\_\_ 11. Each lobe of the lungs is like a balloon filled with rubber-like lung tissue.
- \_\_\_\_\_ 12. The pleura consists of two membranes that surround the lobes of the lungs and separate the lungs from the chest wall.

## HEALTH and GUIDANCE

Exercise 2

Fill in the blanks with suitable words chosen from your notes.

1. The organs that supply the body with air make up the \_\_\_\_\_ system.

2. Organs which form the respiratory system are the nose,

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
\_\_\_\_\_, \_\_\_\_\_, and  
\_\_\_\_\_.

3. In the nasal passages formed by the turbinate projections and in the sinus cavities air is moistened, \_\_\_\_\_, and  
\_\_\_\_\_.

4. The larynx connects the pharynx with the \_\_\_\_\_.

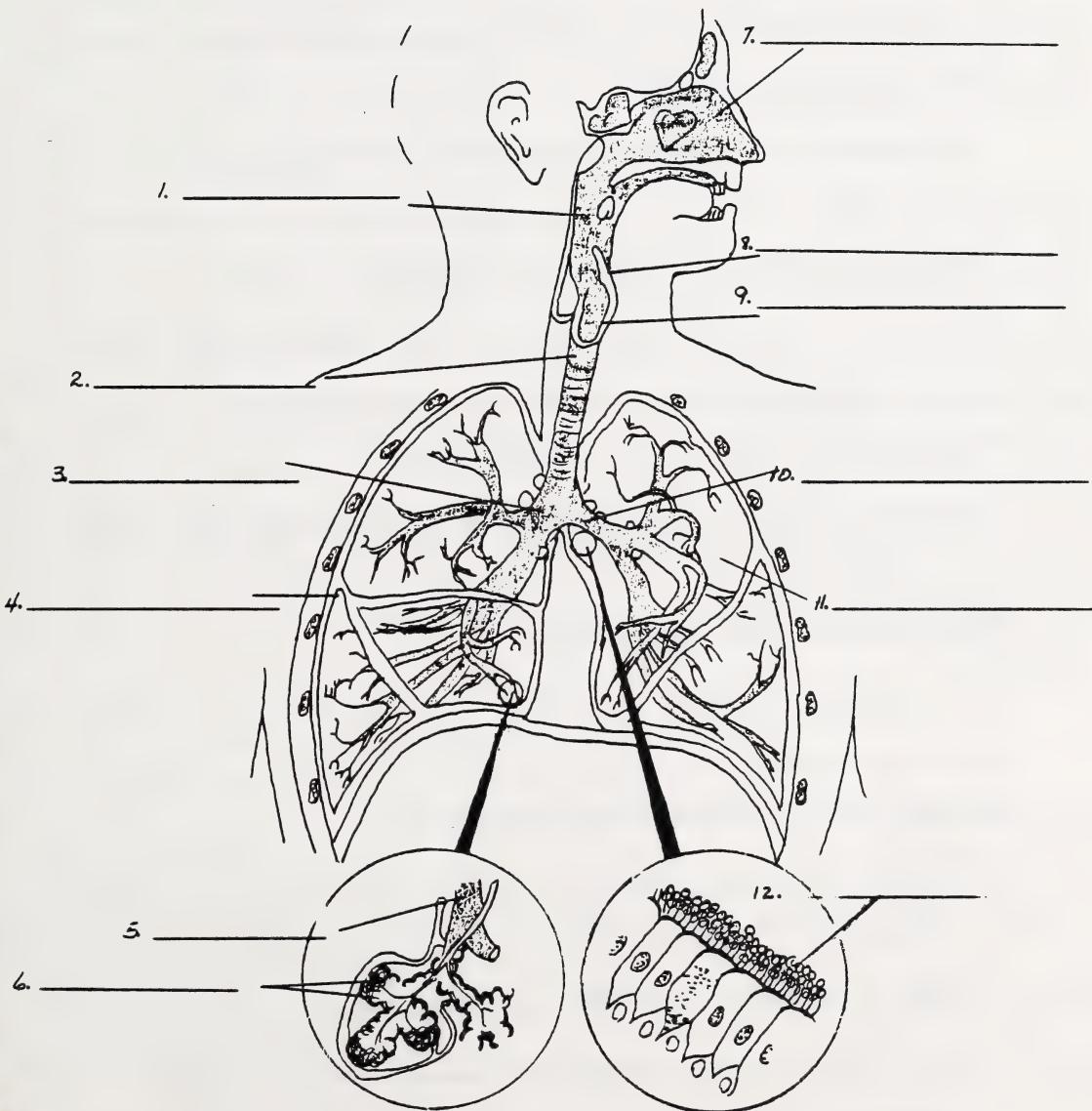
5. The trachea extends from the bottom of the \_\_\_\_\_, through the neck and into the chest cavity. At its lower end the trachea divides into two tubes \_\_\_\_\_ and \_\_\_\_\_.
- The bronchi lead into the \_\_\_\_\_.

6. Each bronchus divides and subdivides within the \_\_\_\_\_ forming a network of \_\_\_\_\_. These divisions are called \_\_\_\_\_. Each bronchial tube ends in a tiny chamber from which \_\_\_\_\_ extend in clusters. These air sacs are called \_\_\_\_\_. Tiny \_\_\_\_\_ surround each of the alveoli. The thin walls of the capillaries and \_\_\_\_\_ permit an \_\_\_\_\_ of gases between the \_\_\_\_\_ and the air.

## HEALTH and GUIDANCE

Exercise 3

Several parts of the respiratory system have been numbered on the diagram. In the space beside each number, write the name of the corresponding part.



## HEALTH and GUIDANCE

Exercise 4      Mechanics of Breathing

Answer in sentences.

1. How many different processes are involved in respiration?

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2. What are these processes?

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3. Where does external respiration take place?

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4. Where does internal respiration take place?

---

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5. What affects the rate of breathing?

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6. How long can a person hold his breath?

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7. a. Why is it harder to breathe at high altitudes?

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## HEALTH and GUIDANCE

- b. How have people made body adjustments to regions of high altitudes?

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- c. From what areas do many long distance runners come?

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---

8. a. In high pressure areas what is forced into the lungs?

---

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- b. What is picked up in the alveoli?

---

---

- c. If a person goes quickly to a lower pressure area what happens to the extra supply of oxygen and nitrogen?

---

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- d. What do the bubbles of nitrogen do?

---

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- e. Why are deep sea divers and miners brought to the surface slowly?

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## HEALTH and GUIDANCE

9. A person may feel that he is about to smother although the room contains plenty of oxygen. Three things may be responsible for bringing about the smothering feeling. What are they?

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10. On a very hot day temperatures inside the body may be cooler than the outside. How are the temperatures equalized?

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---

11. Why does a person feel discomfort when the air is hot and humid?

---

---

12. Why does a person feel the cold more intensely when the air is cold and humid?

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**LESSON RECORD FORM**

0905 Health 9

Rev. 88/04

**FOR STUDENT USE ONLY**

Date Lesson Submitted \_\_\_\_\_

(If label is missing  
or incorrect) \_\_\_\_\_

Time Spent on Lesson \_\_\_\_\_

File Number \_\_\_\_\_

Lesson Number \_\_\_\_\_

**Student's Questions  
and Comments****Apply Lesson Label Here**

Name \_\_\_\_\_

Address \_\_\_\_\_

Postal Code \_\_\_\_\_

*Please verify that preprinted label is for  
correct course and lesson.***FOR SCHOOL USE ONLY**Assigned  
Teacher: \_\_\_\_\_

Lesson Grading: \_\_\_\_\_

Additional Grading  
E/R/P Code: \_\_\_\_\_

Mark: \_\_\_\_\_

Graded by: \_\_\_\_\_

Assignment Code: \_\_\_\_\_

Date Lesson Received: \_\_\_\_\_

Lesson Recorded \_\_\_\_\_

**Teacher's Comments:**

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**MAILING INSTRUCTIONS FOR CORRESPONDENCE LESSONS**

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## HEALTH and GUIDANCE

## The Respiratory System (continued)

## Diseases of the Respiratory System

## A. The Common Cold

Many different viruses and bacteria can cause a cold. When resistance is low one of these organisms may be responsible for an infection. An infection attacks the mucous membrane of the respiratory system and causes inflammation. After the infection has run its course, the membranes shrink and heal very quickly. A cold usually lasts about seven days.

Colds, in themselves, are not dangerous but a simple cold can lead to more serious troubles. The infection can follow the Eustachian tube and settle in the middle ear or it may enter the sinus cavities.

Efforts to produce immunity to colds have had poor results. Antibiotics may reduce complications but they do not stop the cold virus. For the treatment of a cold a doctor usually prescribes rest and the drinking of fluids.

## B. Sinusitis

The membranes which line the nasal passages extend into the sinus cavities. By blowing the nose too hard infected mucus can be forced into the sinuses. To avoid this, the nose should be blown gently with both nostrils open.

When a sinus cavity becomes infected, the mucous membrane swells and may close off the drainage outlet. Bacteria trapped in the cavities multiply rapidly. Pressure in the sinus causes pain and headache. Often the membrane shrinks and drains of its own accord but in severe cases a doctor may need to force water or a mild antiseptic fluid through the clogged sinus cavity.

Frontal sinus infections are very dangerous. Pressure can break the thin back wall of a sinus cavity and the infection may then spread to the membranes of the brain.

## C. Tonsillitis

Tonsils are lymph nodes embedded in folds of tissue on either side of the pharynx. Tonsils are an unimportant part of the germ-fighting system of the body.

## HEALTH and GUIDANCE

Under normal conditions tonsils rid themselves of the bacteria they pick up. In some cases, however, tonsils become so infected that a condition known as tonsillitis develops. If tonsillitis, sore throat, and other respiratory infections become frequent the doctor may recommend removal of the tonsils (tonsillectomy). Tonsillectomy is a simple operation.

Tonsils in children are normally larger than in adults. Only when tonsils interfere with breathing and swallowing should they be removed.

### D. Adenoids

Adenoids are tonsil-like masses of tissue which grow high on the back wall of the pharynx. Like tonsils they tend to shrink after childhood. Enlarged adenoids may block the openings to the Eustachian tubes. This can lead to deafness. When adenoids block the passage between nose and throat they force mouth breathing. Greatly enlarged adenoids should be removed.

### E. Streptococcus Infections

Among the streptococcus infections "strep throat" is one of the most severe. Not all streptococcus bacteria are harmful but dangerous members can cause scarlet fever and some heart valve infections. Infections may attack any part of the body.

During a "strep throat" infection a powerful poison is absorbed into the blood stream. Rheumatic fever may result. Heart damage frequently follows rheumatic fever. An acute inflammation of the kidneys, known as nephritis, is another serious complication.

### F. Laryngitis

Air passes from the pharynx into the larynx or voice box. The larynx is broad at the top but at the bottom, where it joins the trachea, it is narrow. In boys the larynx, frequently referred to as the "Adam's apple," is often quite prominent. Colds and other respiratory infections may travel to the larynx and cause laryngitis. In laryngitis the mucous membrane becomes inflamed and the swelling extends to the vocal cords. This causes hoarseness and sometimes loss of voice. Over-exertion of vocal cords will also cause hoarseness. Have you ever become hoarse from yelling at a ball game?

If, however, a stubborn hoarseness persists, consult a doctor. Cancer sometimes develops in the vocal cords. If discovered in the early stages cancer can be cured through treatment or by surgery.

## HEALTH and GUIDANCE

## G. Bronchitis

Respiratory infections such as colds and sore throat may invade the bronchial passages which lead to the lungs. Infection in the bronchial tubes is known as bronchitis. Inflammation in the tubes causes harsh breathing and a deep cough.

## H. Whooping Cough

Whooping cough bacteria attack the membranes of the trachea and bronchial tubes and produce severe irritations. A sticky mucous secretion which forms in the passages interferes with breathing. The patient may then have violent coughing spells accompanied by vomiting. When the patient, after a coughing spell, gasps for air, he makes a high pitched whooping sound. Fortunately, most young children are given immunity to whooping cough by means of immunizing shots. Whooping cough could be eliminated, just as smallpox has been, if all parents would co-operate.

## I. Pleurisy

One pleural membrane lies over the lungs; the other one lines the chest cavity. Separating the two membranes is a thin layer of fluid which prevents the membranes from rubbing together during the process of breathing. When inflammation of the pleura causes swelling and irritation, a condition known as pleurisy results. If you place your ear against a chest inflamed with pleurisy, you can hear the membranes rubbing together with each breathing motion. Breathing is a painful process for a person suffering from pleurisy.

## J. Pneumonia

Several different lung infections are referred to as pneumonia. Bronchial pneumonia may be the result of a neglected sore throat or of bronchitis. In lobar pneumonia, infection centres in the bronchial tubes and alveoli and fills them with fluid and pus. An entire lobe of a lung may become almost solid. In virus pneumonia, which often follows a severe neglected cold, infection occurs in patches. The symptoms which include fever, headache, and weakness are not so severe as those of the other pneumonias.

## K. Tuberculosis of the Lung

Tuberculosis may strike any part of the body but it is usually associated with the lungs. Tuberculosis bacteria attack the alveoli

## HEALTH and GUIDANCE

and cause a lesion known as a tubercle. If the body "walls off" the lesion, circulation is cut off and the death of the tissue within the wall results. Poisons and bacteria from the dead tissues are absorbed by the blood and spread through the body. Fever, night sweats, general weakness, loss of appetite and weight follow. A cough, which may be severe, develops. Sputum may contain blood.

The lesions of early tuberculosis are revealed by X-ray. Treatment at this stage is effective.

### L. Cancer of the Lung

The lungs are common locations of cancer in older people. In primary lung cancer disease starts in the lungs. In secondary lung cancer, cancerous tissue is deposited in the lungs through circulation.

One of the earliest symptoms of this disease is a chronic cough which produces a blood-tinged mucous discharge. In some cases there is pain in the chest. Cancer in a lung is very difficult to treat. The only hope for cure lies in early diagnosis.

There is no definite proof that smoking causes lung cancer. However, the fact that there is a greater number of cases of lung cancer in heavy smokers is viewed with suspicion.

### M. Poliomyelitis

Poliomyelitis is caused by a virus which damages or destroys the cell bodies of motor nerves in the spinal cord. Polio is not a disease of the muscles although its effects are seen in the muscles. If many nerve-cell bodies are entirely destroyed the muscles they control become permanently paralyzed.

Some kinds of polio involve the brain. The medulla of the brain is sometimes called the "bulb". If the virus infection settles in the "bulb", the patient develops bulbar poliomyelitis. Many of the vital nerve centres, including those which control breathing, are found in the medulla. A bulbar polio patient may need help with his breathing so an "iron lung" is brought in. Secondary muscles can be trained and a patient may later be able to dispense with his mechanical breathing device.

#### Salk Vaccine

Only recently the viruses that cause poliomyelitis were discovered. Once the organisms were found scientists endeavored to find a suitable vaccine. The fact that there are several types of

## HEALTH and GUIDANCE

polio made the task more difficult. In 1953 Dr. Jonas Salk began tests with a vaccine containing dead polio viruses of three types of polio. The tests he performed were successful. Salk vaccine is injected with a hypodermic needle.

### Sabin Vaccine

The Sabin type of vaccine which contains live viruses is now in general use. This type of vaccine can be taken orally (by mouth). Sabin vaccine is manufactured by the Connaught Laboratories in Toronto.

### Gamma Globulin

Gamma Globulin commonly called GG is used as an immunizing agent in connection with such diseases as polio and measles.

Gamma Globulin is used to give immediate protection against polio. This immunizing serum is taken from the blood of a person who has had polio and whose blood has built up antibodies. This serum made up of antibodies is given to children definitely exposed to polio and to members of the polio victim's family.

Gamma Globulin containing antibodies taken from the blood of a patient ill with measles is also used to protect children against measles.

### N. Asphyxia

Obstruction of air passages, interference with breathing movements, lack of sufficient oxygen in the air, or the inability of blood to deliver oxygen, are all factors which will result in tissue suffocation or asphyxia. Anoxia which means lack of oxygen is a better name.

A bit of food or a foreign object can block the passage of air if it lodges in the glottis or trachea. Coughing may dislodge the foreign object and force it up, and out. However, if coughing fails, the fingers must be used immediately to remove the object if the person's life is to be saved. If the object cannot be removed a doctor should be summoned. While waiting for the doctor to come artificial respiration should be given.

Drowning is responsible for most cases of asphyxia but abandoned dry wells can also snuff out life. Heavy gases settle in the wells and crowd out oxygen. The bottoms of silos are also dangerous because oxygen is used up during fermentation of the

**HEALTH and GUIDANCE**

silage. A person should be very careful when entering any closed, poorly-ventilated place. A feeling of dizziness or light-headedness may be the first warning of lack of oxygen. Unconsciousness soon follows.

The Holger-Nielson and Mouth-to-Mouth methods of artificial respiration may be used in cases of asphyxia. These methods will be discussed in Lesson 12.

## HEALTH and GUIDANCE

## Diseases and Disorders of the Respiratory System

Exercise 1

Answer T (True) if the statement is true; answer F (False) if the statement is false.

- \_\_\_\_\_ 1. Many different viruses and bacteria can cause a cold.
- \_\_\_\_\_ 2. Colds in themselves are not dangerous but a simple head cold can lead to more serious troubles.
- \_\_\_\_\_ 3. Blowing the nose too hard causes many sinus infections.
- \_\_\_\_\_ 4. Tonsils in children are normally smaller than in adults.
- \_\_\_\_\_ 5. Greatly enlarged adenoids which force mouth breathing should be removed.
- \_\_\_\_\_ 6. Rheumatic fever or nephritis often follows a strep throat.
- \_\_\_\_\_ 7. In laryngitis the mucous membrane becomes inflamed and the swelling extends to the vocal cords.
- \_\_\_\_\_ 8. Most young children are given immunity to whooping cough by means of "shots".
- \_\_\_\_\_ 9. A thick layer of fluid separates the two pleural membranes.
- \_\_\_\_\_ 10. Several different lung infections are referred to as pneumonia.
- \_\_\_\_\_ 11. Tuberculosis bacteria attack the alveoli (air sacs) in the lungs.
- \_\_\_\_\_ 12. Cancer in the lungs is very difficult to treat.

## HEALTH and GUIDANCE

Exercise 2

Answer the following questions in sentence form.

1. What are two serious complications of strep throat?

---

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2. What is the danger of neglecting long continued hoarseness?

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3. What is the cause of pain in pleurisy?

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4. Many people who have accidentally fallen into uncovered dry wells have suffocated in them. How could this be possible?

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---

5. What is the most frequent cause of asphyxia?

---

---

6. Why might there be a lack of oxygen in the bottom of a silo?

---

---

7. Against how many types of polio is Salk vaccine effective?

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## HEALTH and GUIDANCE

8. Sabin vaccine differs from Salk vaccine in two ways. What are they?

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9. In your own words explain what Gamma Globulin is and how it is used.

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Exercise 3

Match the predicates in Column B with the subjects in Column A to make complete true statements. Place the letter of your choice in the space provided.

## Column A

## Column B

- |       |                                   |                                                                                                         |
|-------|-----------------------------------|---------------------------------------------------------------------------------------------------------|
| _____ | A simple head cold                | a. are referred to as pneumonia.                                                                        |
| _____ | Frontal sinus infections          | b. may strike any part of the body.                                                                     |
| _____ | A thin layer of fluid             | c. are very dangerous.                                                                                  |
| _____ | Several different lung infections | d. is caused by a virus which damages or destroys the cell bodies of motor nerves in the spinal column. |
| _____ | Tuberculosis                      | e. can lead to more serious trouble.                                                                    |
| _____ | Polio                             | f. show up in the muscles.                                                                              |
| _____ | The effects of polio              | g. separates the two pleural membranes.                                                                 |



**LESSON RECORD FORM**

0905 Health 9

Rev. 88/04

**FOR STUDENT USE ONLY**Date Lesson Submitted  
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Time Spent on Lesson  
\_\_\_\_\_(If label is missing  
or incorrect)File Number  
\_\_\_\_\_

Lesson Number \_\_\_\_\_

**Student's Questions  
and Comments****Apply Lesson Label Here**

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Postal Code			

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**Teacher's Comments:**

## **ALBERTA CORRESPONDENCE SCHOOL**

### **MAILING INSTRUCTIONS FOR CORRESPONDENCE LESSONS**

#### **1. BEFORE MAILING YOUR LESSONS, PLEASE SEE THAT:**

- (1) All pages are numbered and in order, and no paper clips or staples are used.
- (2) All exercises are completed. If not, explain why.
- (3) Your work has been re-read to ensure accuracy in spelling and lesson details.
- (4) The Lesson Record Form is filled out and the correct lesson label is attached.
- (5) This mailing sheet is placed on the lesson.

#### **2. POSTAGE REGULATIONS**

Do **not** enclose letters with lessons.

**Send all letters in a separate envelope.**

#### **3. POSTAGE RATES**

First Class

**Take your lesson to the Post Office and have it weighed. Attach sufficient postage and a green first-class sticker to the front of the envelope, and seal the envelope. Correspondence lessons will travel faster if first-class postage is used.**

**Try to mail each lesson as soon as it has been completed.**

**When you register for correspondence courses, you are expected to send lessons for correction regularly. Avoid sending more than two or three lessons in one subject at the same time.**

## HEALTH and GUIDANCE

## Unit II - The Circulatory System

## The History of Man's Thinking about the Heart and Blood

## A. Early Ideas

Today everyone knows that the blood makes a continuous circuit through the body; it is being constantly pumped by the heart through the arteries, and constantly carried back to the heart by the veins. This fact has not always been known. During ancient times and through the Middle Ages, men believed that the liver was manufacturing new blood all the time and that the body used it up as fast as it was made. They knew the blood moved but they did not know how or why. They did not understand the circulation of the blood or how the heart functions.

## Galen

About 130 - 200 A.D., Galen, a noted physician of Rome, had a theory whereby he attributed many vital processes to spirits. According to him there were three types of so-called spirits associated with three types of activities of living things. These were the natural spirits, formed in the liver and distributed by the veins; the vital spirits, formed in the heart and distributed by the arteries; and the animal spirits, formed in the brain and distributed by the nerves. The animal spirits were especially associated with the higher functions of sensation and motion. The belief was that venous blood, charged with natural spirits, passed through the minute pores in the septum of the heart. When the blood flowed from the right ventricle to the left ventricle it became charged with vital spirits. Arterial blood, charged with vital spirits, became converted to animal spirits in the brain and was thence distributed by the nerves. The pulsation of the heart and arteries was due to the expansion of the contained spirits. Galen's system, fanciful as it may seem now, was, in fact, an admirable working hypothesis based on much experimental evidence.

## William Harvey

The English physician, William Harvey, is considered to be the discoverer of blood circulation. His explanation of the movements of the heart and blood ranks him as one of the pathfinders of medical history. It was Harvey's description of the circulation of blood which convinced people that Galen could have been mistaken.

In 1628 Harvey proved that the blood in the body moves as a continuous stream from a central source (the heart) and back to it. He showed that the heart is a pump which keeps the blood circulating through tubes or blood vessels.

## HEALTH and GUIDANCE

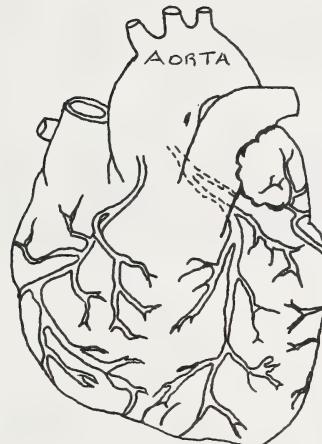
Harvey established the facts we know today about the action of the heart and the movement of the blood. The left side of the heart receives oxygen-bearing blood from the lungs and forces it out through the great artery to all the tissues of the body. From these tissues the blood is sent back to the right side of the heart through the veins and is forced to the lungs to commence the cycle again.

The vessels that carry blood away from the heart are called arteries; those that carry blood back to the heart are called veins. The microscopic, thin-walled tubes that connect arteries and veins are called capillaries. Harvey was not able to see the blood pass from the arteries to the veins in the capillaries because the microscope had not yet been invented.

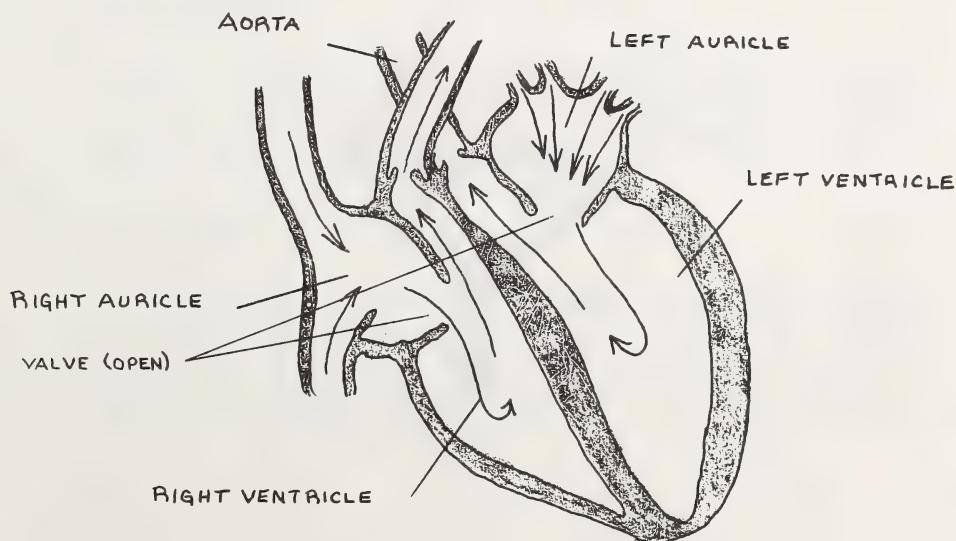
## HEALTH and GUIDANCE

## Structure of the Circulatory System

## A. The Heart



The heart, a cone-shaped, muscular organ about the size of a person's two fists, is situated under the breast bone and between the lungs. A vertical wall, called the septum, divides the heart into two completely separate parts. Each side of the heart consists of two parts -- a thin-walled upper chamber called an auricle and a thick-walled, muscular lower chamber called a ventricle. One-way valves divide the auricles and ventricles. See diagrams.



## HEALTH and GUIDANCE

## B. Arteries

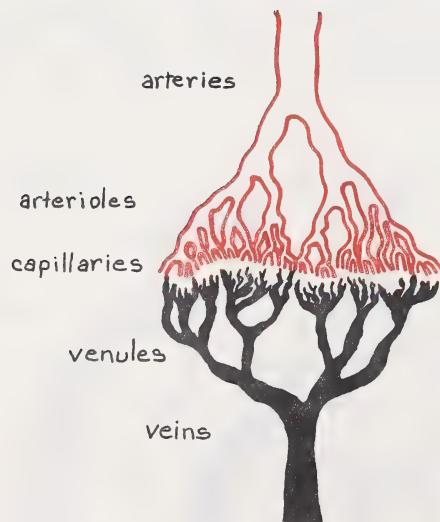
Arteries, which have elastic, muscular walls and smooth linings, carry blood away from the heart. As they reach the various parts of the body, arteries branch and become smaller. Small arteries are called arterioles.

## C. Capillaries

As arterioles penetrate the tissue, they branch into smaller vessels, called capillaries. Capillaries are so small that red corpuscles must pass through them in single file. The smallest human capillaries are about one-fiftieth as big around as the smallest human hair.

## D. Veins

Veins which carry blood to the heart, grow larger as they approach the heart. The walls of the veins are thinner and not so strong as are the walls of the arteries. The larger veins are fitted with cup-like valves which prevent blood from flowing backward. Small veins are called venules. Capillaries lie between the arterioles and the venules.



## HEALTH and GUIDANCE

## E. Blood

## Its composition

## 1. Plasma

In the body of the average person there are about twelve pints of blood. More than half of the blood is made up of a pale yellow watery substance, known as plasma. Red corpuscles, white corpuscles, and platelets which float in plasma form the solid portion of the blood. Plasma carries food to the tissues and transports cell wastes and heat. Plasma gives blood the volume needed to maintain blood pressure.

Some of the plasma in the blood passes through the walls of the capillaries to become cell fluid known as lymph. Lymph fills the spaces between the cells.

## 2. The white corpuscles

The lymph contains billions of white corpuscles which are less numerous than red ones. The ratio is about one white cell to 600 red cells. These white cells have the ability to change their shape, move about in the blood, and squeeze through the thin walls of the capillaries into the tissue spaces. White corpuscles are an important defence of the body against infection. They collect in the area of an infection and destroy bacteria in vast numbers.

## 3. Red corpuscles

Red corpuscles are shaped like disks with both sides dented in. These cells greatly outnumber white corpuscles and platelets. The average person has between 25 and 30 trillion red cells in his blood.

## 4. Haemoglobin

Haemoglobin, largely composed of iron, unites readily with oxygen and gives red blood cells their color. When haemoglobin is carrying a full load of iron the blood is bright red. After some of the oxygen has been discharged the blood becomes a darker red.

## HEALTH and GUIDANCE

## 5. Platelets

The blood platelets are colorless disk-shaped bodies about one third the size of the red corpuscles. The ratio of platelets to red corpuscles is about one to ten. Blood platelets in the area of a broken blood vessel disintegrate to release a substance which speeds up the process of clotting.

## 6. Antibodies

The body has special kinds of defences against certain diseases. Each kind of germ stimulates the body to produce a special chemical to fight that germ. These chemicals which are present in the blood stream are called antibodies.

## 7. Hormones

Endocrine glands which have no ducts and which act in a special way, pour their secretions, known as hormones, directly into the bloodstream for transfer to all parts of the body. The four best known endocrine glands are the thyroid, the pituitary, the adrenals, and the pancreas.

The endocrine system will be studied in a later lesson.

## 8. Blood types

There are four main groups of blood, namely, A, B, AB, and O. When a person requires a blood transfusion he must receive blood which matches his blood group. Therefore, group A blood is given to patients with group A blood, group B blood to patients with group B blood, and so forth. Giving group A blood to a patient with group B blood causes group B cells to clump (huddle together in masses). A clump of cells may plug the very fine capillaries. A clot in the blood vessels of the brain, heart, or lungs may cause almost instant death.

To be sure that the blood to be given to a person "agrees" with his blood, samples of each are first cross-matched. If the cells from the donor's sample do not clump when added to the blood serum of the patient's sample, the bloods are compatible and successful transfusion is possible.

## HEALTH and GUIDANCE

## 9. Rh factor

Another characteristic of blood is known as the Rh factor. Rh is a chemical substance present on the red blood cells of 85% of all people. These people who have the Rh factor are Rh positive. The 15% of the people who do not carry the Rh chemical in their blood are Rh negative. This is an inherited condition and does not change throughout life. The Rh factor serves no known purpose. It can, however, cause complications.

The Rh factor must be taken into consideration when transfusions are given. If Rh positive blood is transfused into the blood stream of an Rh negative person it may cause the Rh negative blood to produce antibodies. When this occurs, we say that the Rh negative person has been "sensitized to the Rh factor". Any subsequent transfusion of Rh positive blood could result in a serious, if not fatal, transfusion reaction. The antibodies present in the Rh negative blood will attack and destroy the Rh positive blood cells.

Serious complications may develop when an Rh negative mother is bearing a baby with Rh positive blood, particularly if the mother has been sensitized to the Rh factor through transfusion or a previous pregnancy. The deadly antibodies in the mother's blood may result in serious problems for the infant who may suffer from anemia, hemorrhage, and damage to the liver and bones. Occasionally the child dies before birth. If the damage is not too extensive, an immediate transfusion may save the child's life. In some cases, the infant's blood is almost entirely replaced with transfused blood.

## HEALTH and GUIDANCE

Exercise 1 The History of Man's Thinking about the Heart and Blood

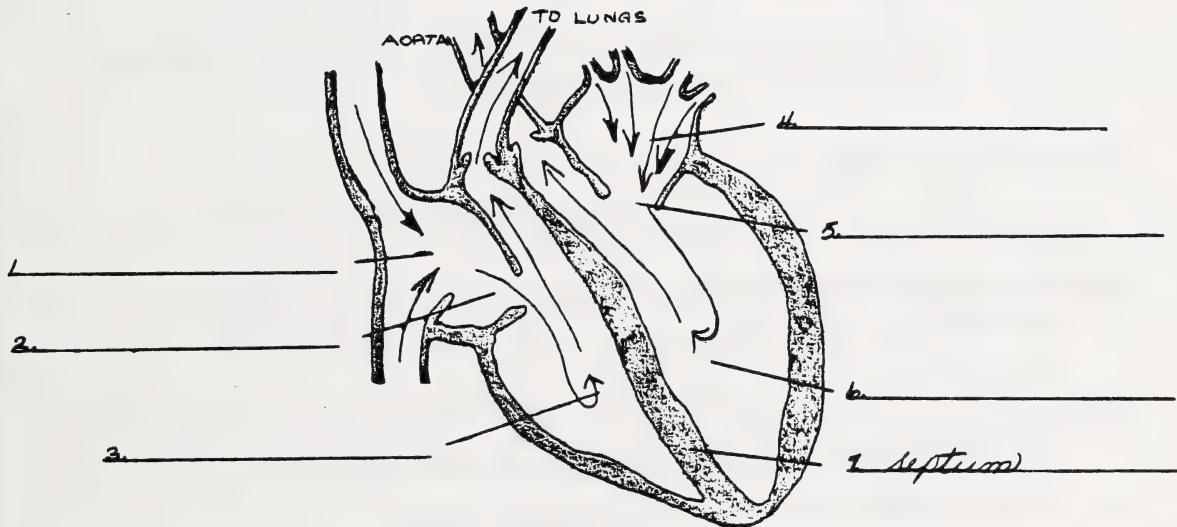
Several completions have been given for each sentence. Some completions form correct statements; others do not. Place a check mark (✓) beside those completions that form correct statements; put an (X) beside those that do not. The first has been done.

1. The heart is ✓ a very strong organ.  
X a very weak organ.  
X the size of a marble.  
✓ the size of a fist.  
✓ hollow.
  
2. Galen believed    blood was manufactured in the liver.  
   blood did not move.  
   body processes were guided by spirits.  
   blood passed by means of a valve from the right ventricle to the left ventricle.  
   the pulse was caused by the rhythmic swelling of an artery.
  
3. Harvey believed    venous blood was charged with natural spirits.  
   the heart is a pump which keeps the blood circulating.  
   the body used up the blood as fast as it was made.  
   the left side of the heart receives oxygen-bearing blood from the lungs.  
   Galen was absolutely correct in all his theories.

## HEALTH and GUIDANCE

Exercise 2      The Heart

Several parts of the heart have been numbered on the diagram. In the space beside each number, write the name of the corresponding part.



Exercise 3      Arteries, Capillaries, Veins

If the statement is true write T; if the statement is false write F.  
Use the space provided.

- \_\_\_\_\_ 1. Arteries carry blood away from the heart.
- \_\_\_\_\_ 2. Arteries have elastic, muscular walls and rough linings.
- \_\_\_\_\_ 3. Arteries branch into smaller vessels called arterioles.
- \_\_\_\_\_ 4. Capillaries are microscopic in size.
- \_\_\_\_\_ 5. Capillaries leaving an organ unite to form veins.
- \_\_\_\_\_ 6. Large veins are fitted with cup-like valves which prevent the blood from flowing backwards.

Exercise 4      Blood

Answer the questions in sentence form.

1. How many pints of blood are there in the body of the average person?

---

---

2. What portion of the blood does plasma form?

---

---

3. What is lymph?

---

---

4. What is the ratio of white corpuscles to red corpuscles?

---

---

## HEALTH and GUIDANCE

5. Which cells guard the body against infection?

---

---

6. About how many red cells are there in the blood of the average person?

---

---

7. Why are platelets important?

---

---

8. a. Where is haemoglobin found?

---

- b. With what substance does haemoglobin readily unite?

---

9. What are the chemicals which fight disease germs in the body called?

---

---

10. What are the glands which pour hormones directly into the blood stream called?

---

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Exercise 5

Complete the fol

1. There are four

\_\_\_\_\_

2. A person receiv

\_\_\_\_\_

3. Giving group A 1

group B blood ca

4. A plugging of the

\_\_\_\_\_

5. a. Explain in yo

Rh factor".

\_\_\_\_\_

- b. A second tra

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6. a. Serious comp

is bearing a

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- b. In some case

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Graded by: \_\_\_\_\_

Assignment Code: \_\_\_\_\_

Date Lesson Received:

Lesson Recorded \_\_\_\_\_

Exercise 5

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1. There are four

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Social Studies 20, Student Module, Module 7, Quality of Life. 0-7741-0049-4

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Futures: Possibilities For Change ..... 0-7741-0073-7

Social Studies 20, Learning Facilitator's Manual, Module 8  
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BOX 1 OF 2

..... correct course and lesson.

Exercise 5

Complete the

1. There are four

\_\_\_\_\_

2. A person receives

\_\_\_\_\_

3. Giving group A  
group B blood

4. A plugging of the

\_\_\_\_\_

5. a. Explain in full the "Rh factor".

\_\_\_\_\_

- b. A second transfusion to an Rh negative woman

\_\_\_\_\_

6. a. Serious complications may occur if a woman who is bearing a

\_\_\_\_\_

- b. In some cases

\_\_\_\_\_

\_\_\_\_\_

**LESSON RECORD FORM**

0905 Health 9

Rev. 88/04

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**Teacher's Comments:**

**ALBERTA CORRESPONDENCE SCHOOL**  
**MAILING INSTRUCTIONS FOR CORRESPONDENCE LESSONS**

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## HEALTH and GUIDANCE

### The Circulatory System (continued)

#### Function

##### A. The Heart

The blood stream flows from the body through veins into the right side of the heart. From there it is pumped to the lungs where it gets rid of waste gas (carbon dioxide) collected from the body cells and where it picks up a load of oxygen to carry to the body cells. After passing through the lungs, the blood flows into the left side of the heart from which it is pumped through the arteries to the body. Because it has more work to do, the left side of the heart is larger than the right side.

When the heart beats, it contracts, sending blood out into the arteries. It then relaxes, permitting blood from the veins to flow into the heart. It takes 1/3 to 1/2 minute for blood to flow from the heart to the farthest parts of the body and back again.

The heart has valves which allow the blood to go in one direction only. These valves are small delicate structures that are easily injured. In order that the heart may function properly, the valves must fit tightly and the muscles must be strong. The heart muscle is supplied with blood by special arteries known as the coronary arteries.

In the interval between contractions, the valves between the auricles and ventricles stay open as the heart relaxes and fills with blood. This is a rest period. When the ventricles contract, the valves close, and each ventricle forces out about one-third cup of blood into its artery. This blood pushes forward and keeps the whole stream pushing forward. The valves keep the blood from flowing backwards.

Valves that do not close tightly allow some blood to seep backwards and cause a heart leakage at the valves. The heart has to work harder to repump the blood and the added exercise may gradually cause the heart to become enlarged.

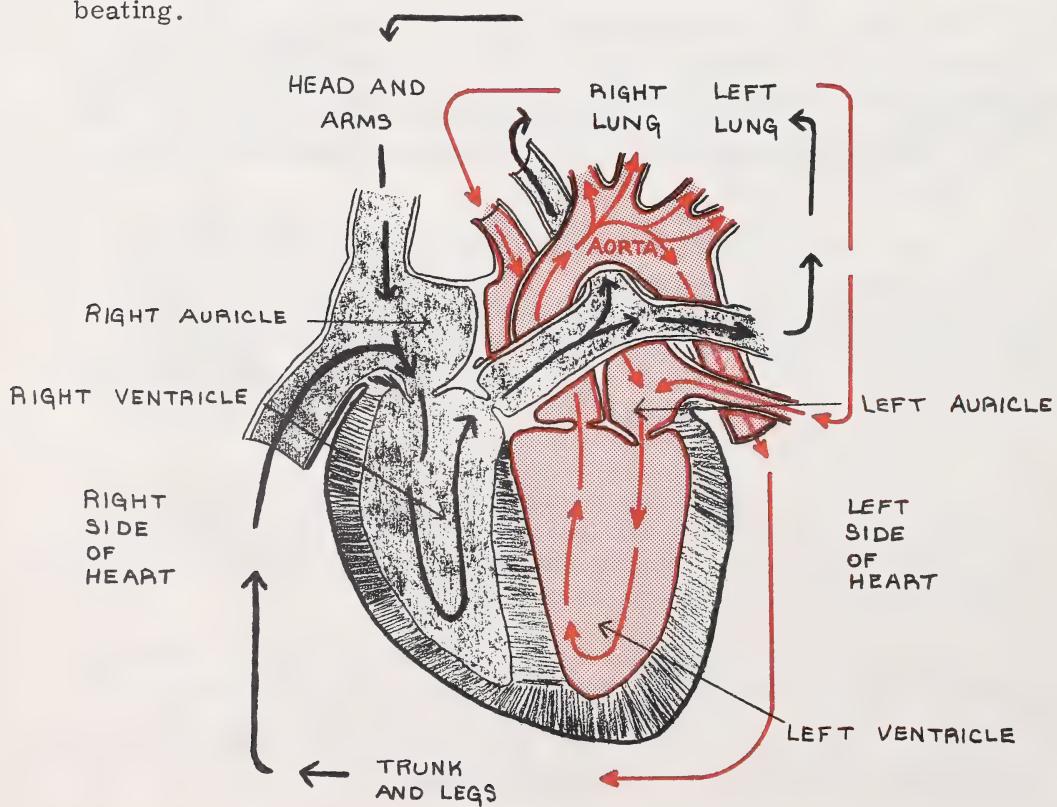
The rate of heartbeat varies greatly among people. Among adults, the rate may be normally as low as 50 or as high as 90 beats per minute. At birth the rate is about 140. The rate gradually slows down to about 85 in youth and 72 in the adult. It is slightly slower for men than for women.

## HEALTH and GUIDANCE

The person's position and the amount of his activity affect the rate of the heartbeat. When he is lying down the heart does not have to pump against gravity so it slows down. The heart of a person sitting beats 4 times as fast as it does when he is lying down; it beats 10 times as fast when he stands as when he lies. When he does vigorous exercise the heart beats very fast. When he sleeps he is in a prone position and all activities are slowed down. Naturally the heart does not have to work very hard. Thus both position of the body and the amount of activity affect the rate of the heartbeat.

The state of the emotions also affects the rate of the heartbeat. When the person becomes angry, frightened, or excited the heart beats very fast.

All the millions of cells in the body depend upon the rapidly circulating blood stream for life-giving oxygen and other nourishment and for the removal of wastes. The brain in particular must have a continuous supply of oxygen. Since the brain controls the body, death comes within seconds or minutes after the heart stops beating.



## HEALTH and GUIDANCE

The heart's normal pumping action is a continuous series of regular contractions and relaxations -- beat-rest, beat-rest. The heart normally rests twice as much as it works. It rests after each contraction. When the heartbeat slows, the rest periods between contractions are longer and the heart muscle has an opportunity to recover and develop. Since the heart will beat two and one-half billion times and pump 600,000 tons of blood in a seventy-year life time, the health of the heart is important.

The pulse is the rhythmic swelling of an artery resulting from the heart's action. It shows the frequency and regularity of the heartbeat. It can be located wherever an artery is close enough to the surface to be felt by the examiner's finger. In suitable light it can be seen at several points such as the neck, the temple, the inner side of the arm, and the wrist.

### B. The Circulatory Systems

#### 1. Pulmonary System

The pulmonary circuit supplies blood to the lungs only.

In the pulmonary circuit, as the right ventricle contracts, blood is forced into the pulmonary artery and is thence transported to the lungs. In the lungs the blood gives off carbon dioxide and takes on oxygen. The blood is then carried back in the pulmonary vein to the left auricle of the heart.

#### 2. Systemic System

The systemic system supplies blood to the entire body with the exclusion of the lungs .

In the systemic circulation, the left auricle contracts and forces blood into the left ventricle. From the left ventricle the blood is pumped into the great artery, which is known as the aorta, then into arteries, into arterioles, and finally into the capillaries of the tissues throughout the body. From the tissues the blood returns via the capillaries to venules (small veins), to large veins, and eventually to the right auricle of the heart. Here the blood again begins its pulmonary circuit with the contractions of the right auricle and right ventricle.

Study the diagram on page 2.

## HEALTH and GUIDANCE

## C. The Blood

Blood performs essential functions.

- It carries food to body tissues.
- It carries oxygen from the lungs to the body cells.
- It carries carbon dioxide from the body cells to the lungs.
- It carries waste products from cells to excretory organs.
- It carries antibodies and bacteria-killing substances to all parts of the body.
- It distributes hormones and other chemicals.
- It maintains normal body temperature.
- It keeps a balance between internal supplies of water and other fluids.

## D. The Spleen

The spleen is a small organ located below the left side of the diaphragm and behind the stomach. Although it has other functions, the chief function of the spleen is to store blood. In an emergency the spleen is able to contract and release stored blood.

## How to Protect the Circulatory System

The heart is the important centre of the circulatory system. You can help your heart to work efficiently, and at the same time you will be affording protection to the circulatory system.

Try to have an average of nine or ten hours sleep each night. When engaging in vigorous exercise or play, remember to stop for brief periods of rest. Protect yourself as much as possible from infectious diseases, particularly colds and sore throats. Check to see if you were vaccinated for smallpox or inoculated for diphtheria. Avoid anxiety and worry. Learn to accept the "ups and downs" of life. Build good blood by eating foods rich in both vitamins and iron. To make sure you get these foods follow Canada's Food Rules.

Avoid the use of tobacco, alcohol, and patent medicines. Tobacco temporarily increases the heartbeat as much as ten beats per minute. In some forms of heart disease, such as hardening of the arteries of the heart, smoking may bring on a heart attack because the nicotine in tobacco tends to contract blood vessels and so restricts circulation. The use of alcohol should also be avoided since alcohol, because it deadens the nerves that slow the heart down, indirectly speeds up the pulse rate. Do not use patent medicines. Some of these, which include sleeping pills, "pep pills," and "pain killers," contain drugs which affect the heart.

## HEALTH and GUIDANCE

Exercise 1      The Heart

Match the predicate in Column B with the subject in Column A to make true statements. Place the letter of your choice in the space provided.

- | Column A                                      | Column B                                                                                                          |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| _____ The blood                               | a. are exchanged in the lungs.                                                                                    |
| _____ Carbon dioxide and oxygen               | b. supply the heart muscle with blood .                                                                           |
| _____ The left side of the heart              | c. is the rhythmic swelling of an artery resulting from the heart's action.                                       |
| _____ The heart valves                        | d. flows from the body into the right side of the heart.                                                          |
| _____ Coronary arteries                       | e. is larger than the right side.                                                                                 |
| _____ The rate of heartbeat                   | f. affect the heartbeat.                                                                                          |
| _____ Position of body and amount of activity | g. allow blood to travel in one direction only.                                                                   |
| _____ The millions of cells in the body       | h. varies greatly among people.                                                                                   |
| _____ The pulse                               | i. depend upon the rapidly circulating bloodstream for life-giving oxygen, nourishment and the removal of wastes. |

## HEALTH and GUIDANCE

Exercise 2      The Circulatory Systems

a. Complete the sentences.

1. In the pulmonary system, as the right ventricle contracts,

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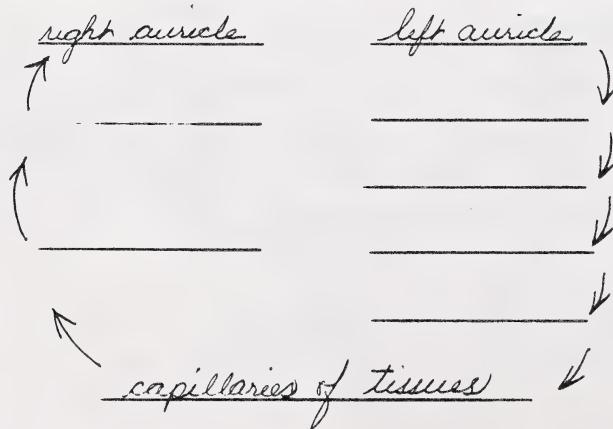
2. In the lungs \_\_\_\_\_ is exchanged for \_\_\_\_\_.

---

3. The pulmonary \_\_\_\_\_ transports blood from the lungs to the heart.

- b. In the systemic system, trace on the chart the course of the blood from the time the left auricle of the heart contracts to force blood into the left ventricle until the blood again returns to the right auricle of the heart. Use the spaces provided.

---



## HEALTH and GUIDANCE

Exercise 3      The Blood

Check (  ) the statements which are correct. Use the spaces provided.

The blood \_\_\_\_\_ performs many essential functions.

\_\_\_\_\_ keeps the balance between internal supplies of water  
and other fluids.

\_\_\_\_\_ distributes hormones and other chemicals.

\_\_\_\_\_ carries waste products to excretory organs.

\_\_\_\_\_ carries food to body tissues.

\_\_\_\_\_ carries oxygen from the body cells to the lungs.

\_\_\_\_\_ carries carbon dioxide from the lungs to the body cells.

\_\_\_\_\_ maintains normal body temperature.

Exercise 4      The Spleen

Write three sentences about the spleen. In the sentences give the location of the spleen, its main function, and explain how stored blood is released from the spleen.

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_

## HEALTH and GUIDANCE

Exercise 5 How to Protect the Circulatory System

Fill in the blanks with suitable words chosen from your notes.

1. Try to get \_\_\_\_\_ of sleep each night.
2. Stop for \_\_\_\_\_ periods of \_\_\_\_\_ when engaging in vigorous exercise or play.
3. Protect yourself from \_\_\_\_\_ diseases.
4. Try to remain emotionally calm. Avoid \_\_\_\_\_ and \_\_\_\_\_.
5. Build good blood. Follow Canada's Food Rules to be sure of a diet rich in \_\_\_\_\_ and \_\_\_\_\_.
6. Avoid the use of \_\_\_\_\_. Tobacco speeds up the heartbeat as much as 10 beats per \_\_\_\_\_.
7. Avoid the use of \_\_\_\_\_.
8. Avoid the use of patent medicines. \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ contain drugs which affect the heartbeat.

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## HEALTH and GUIDANCE

### The Circulatory System (continued)

#### Diseases and Disorders of the Circulatory System

##### A. Rheumatic Fever

Rheumatic infection causes inflammation of the heart valves. There are several reasons for disease of the heart valves but rheumatic fever is the most common. Inflammation causes the formation of scar tissue which weakens and deforms the valves. In some cases the valves will not close properly. The heart then has to work harder because each time the heart beats some blood flows back into the auricle. In other cases the valve becomes too tight and will not let enough blood flow through to the ventricle. The heart then labors to keep sufficient blood flowing.

Rheumatic fever is a health problem of youth. Although it may be the cause of one half the cases of arthritis and one tenth of those of St. Vitus Dance, its most serious effect is on the heart. A large percentage of children who contract the disease develop heart conditions, some of which are severe. Rheumatic fever is known to be closely associated with streptococcal infections of the nose and throat. Efforts to treat throat infections early have, in recent years, reduced cases of heart damage and have saved the lives of hundreds of children.

##### B. Anemia

In iron-deficiency anemia, red cells are present in sufficient quantity but the cells lack normal haemoglobin content. Iron-containing foods such as liver, lean meat, leafy green vegetables, and medicines containing iron are helpful in correcting this type of anemia.

In pernicious anemia the body lacks the substance necessary for red blood cell production. This substance, which is normally stored in the liver, stimulates the red-cell-forming centres of the bone marrow. Liver extract has been found valuable in supplying the missing substance. However, the greatest advance in the conquest of this disease was the discovery of Vitamin B<sub>12</sub>. This vitamin acts as a stimulant to the red-cell-forming centres in the bone marrow.

## HEALTH and GUIDANCE

## C. Arteriosclerosis (hardening of the arteries)

Arteriosclerosis, a degenerative disease usually associated with old age, often occurs early in life. Doctors are not sure whether the arteries harden and cause high blood pressure or whether high blood pressure causes hardening of the arteries but the two conditions seem to go together.

Arteries harden in two ways. During one process calcium deposits form on the muscle coat and the artery loses its elasticity. In other cases, the lining of the artery thickens with internal scale-like deposits, similar to those which form on the inside of a water pipe. These deposits partially close the artery and elevate the blood pressure, thus increasing the work of the heart. The heart must then enlarge to meet additional requirements.

## D. Varicose Veins

Varicose veins almost always occur in the legs. Veins which become bulging bluish cords stand out under the skin. When the valves in the veins weaken, they leak, and no longer assist in moving blood toward the heart. Blood collects in these veins and causes them to bulge. Ulcers may form and sometimes fail to heal. Excessive weight or even the use of tight garters may be the cause of varicose veins. People who must stand for long hours at their work often suffer from this trouble.

The doctor may recommend the use of elastic stockings in an attempt to collapse the bulging veins and send the blood to deeper veins. If the veins are not too large the doctor may inject them with a solution which causes clotting. The veins will eventually disappear. Large veins are usually treated surgically.

## E. Leukemia (a disease involving white-blood cells)

Continued rise in the white-cell count is a symptom of leukemia, one of the most deadly of all diseases. Leukemia is also known as blood cancer. However, this disease does not centre in the blood but in the lymph glands and bone marrow. Here the white-cell-forming centres go wild and load the blood with white corpuscles and the red-cell-forming elements are crowded out. As the platelet count falls, hemorrhages occur in the smaller blood vessels under the skin and in the mucous membranes. Because of overwork, the liver and spleen which filter out the excess of white corpuscles, enlarge and become very painful. Acute leukemia progresses very rapidly.

## HEALTH and GUIDANCE

## F. Haemophilia

Haemophilia is an inherited condition in which blood fails to clot or clots very slowly. This may be due to a defect in one of the plasma proteins. If a person has this disease, a tooth extraction or a slight injury may result in profuse, and therefore, dangerous bleeding. The condition fortunately is not common. It rarely appears in females but can be transferred by mother (a carrier) to son.

## G. Heart Murmurs

If you place your ear against someone's chest you can hear heart sounds. With each beat of the heart you can hear, "Lubb-dupp, lubb-dupp." Some hearts have additional swishing or gurgling sounds which are called murmurs. A murmur may indicate a serious defect but far more often it denotes only a slight deviation from normal and nothing more serious. If you have a heart murmur see a specialist about it. He will very likely tell you to lead a normal life and forget the murmur.

## H. Coronary Thrombosis (heart attack)

The coronary arteries are those which supply the heart muscle with blood. The term heart attack means the sudden closing (occlusion) of a coronary artery by a blood clot (thrombus). This condition, which usually causes severe pain in the chest, never occurs in a normal artery but in one which has previously become thickened or roughened. The pain is sometimes mistaken for acute indigestion. When such severe pain occurs, a doctor should be called. He may prescribe various treatments but the body itself takes over most of the work of healing. When a coronary attack occurs, arteries, in close proximity to the injured one, increase in size and new branches develop to nourish the area surrounding the closed artery. The heart, during the healing period, needs as much rest as possible so the patient must remain in bed for some time. In the majority of cases the patient can, after a time, resume his normal activities.

Anticoagulants, substances which prevent the clotting of blood, may be prescribed by a physician to reduce complications of thrombosis. Sometimes the use of anticoagulants helps to prevent or to delay an attack.

## HEALTH and GUIDANCE

## I. Apoplexy

Apoplexy or paralytic stroke are names commonly used for a condition the doctors call cerebral hemorrhage. A cerebral hemorrhage occurs when a blood vessel bursts in the brain or on its surface. The underlying cause is high blood pressure and hardening of the blood vessel walls. Either mental or physical exertion may be the immediate cause.

A hemorrhage may occur anywhere in the brain and bleeding continues until a clot forms. The clot, which is usually deep in the brain in the region of fibres leading from the motor area, presses on these nerves and paralysis results.

A person may recover from cerebral hemorrhage depending on the extent of the bleeding and the location of the break. A clot absorbs slowly and while absorption is taking place the patient must be kept very quiet.

Cerebral hemorrhage can be avoided. Since it is common after middle age, older people should have regular blood pressure checks. If the blood pressure is dangerously high, both mental and physical exertion should be reduced to a minimum.

## HEALTH and GUIDANCE

Exercise 1      Rheumatic Fever

Match the predicates in Column B with the subjects in Column A to make true complete statements. Place the letter of your choice in the space provided.

Column A	Column B
_____ Rheumatic infection	a. deforms heart valves.
_____ Inflammation of the valves	b. will not close properly.
_____ Scar tissue	c. will not allow enough blood to pass from the ventricle.
_____ Deformed valves	d. causes formation of scar tissue.
_____ Tight valves	e. allow blood to flow back into the auricle.
_____ Leaky valves	f. causes inflammation of the heart valves.
_____ Arthritis and St. Vitus Dance	g. are closely associated with rheumatic fever.
_____ 75% of rheumatic fever patients	h. has reduced cases of heart damage and has saved the lives of hundreds of children.
_____ Streptococcal infections	i. often follow rheumatic fever.
_____ Early treatment of throat infections	j. suffer heart damage.

## HEALTH and GUIDANCE

Exercise 2

Answer the following questions in sentence form.

1. In iron-deficiency anemia, what is lacking in the red cells?

---

---

2. a. In pernicious anemia, what does the body lack?

---

---

- b. What vitamin is now used to stimulate the red-cell-forming centres in the bone marrow?

---

---

3. a. What causes high blood pressure?

---

---

- b. Name three conditions which increase work of the heart.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

- c. How does the partial closing of an artery affect the heart?

---

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## HEALTH and GUIDANCE

4. a. Where do varicose veins almost always occur?

---

---

- b. How are veins which are not too large treated?

---

---

- c. How are very large veins generally treated?

---

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Exercise 3      Leukemia, Haemophilia, Heart Murmurs

If a statement is true write T; if the statement is false write F.  
Use the space provided.

- \_\_\_\_\_ 1. Continued rise in the white-cell count is a symptom of leukemia.
- \_\_\_\_\_ 2. Leukemia is also known as blood cancer.
- \_\_\_\_\_ 3. Haemophilia is not an inherited condition.
- \_\_\_\_\_ 4. In haemophilia blood fails to clot or else clots very slowly.
- \_\_\_\_\_ 5. A heart murmur may indicate a serious defect in the heart.
- \_\_\_\_\_ 6. A heart murmur often denotes a condition which deviates only slightly from normal.

## HEALTH and GUIDANCE

Exercise 4      Coronary Thrombosis, Apoplexy

Complete the following sentences.

1. The coronary arteries are the arteries which \_\_\_\_\_.
2. The term heart attack means the sudden closing of \_\_\_\_\_.
3. When a coronary attack occurs the body itself takes over most \_\_\_\_\_.
4. The heart during the healing period needs \_\_\_\_\_.
5. In most cases healing is so successful a patient can, after a time, \_\_\_\_\_.
6. Apoplexy and paralytic stroke are the names commonly used for a condition the doctors call \_\_\_\_\_.
7. a. A cerebral hemorrhage occurs when \_\_\_\_\_.  
\_\_\_\_\_.
- b. Cerebral hemorrhage can \_\_\_\_\_.
- c. To guard against cerebral hemorrhage older people should have regular \_\_\_\_\_.

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**HEALTH and GUIDANCE****The Circulatory System (continued)****First Aid****A. Arterial, venous, and capillary bleeding**

Hemorrhage, or bleeding, may be external when blood spills from the body, or internal when blood leaves the blood vessels but remains within cavities of the body. Severe hemorrhage must receive immediate attention. The three kinds of hemorrhage are arterial, capillary, and venous.

Blood from an artery is bright red. If the wounded artery is near the skin, the blood spurts out in jets corresponding with the pulsation of the heart. Blood issues from the side of the wound nearer the heart.

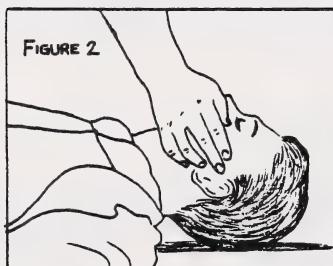
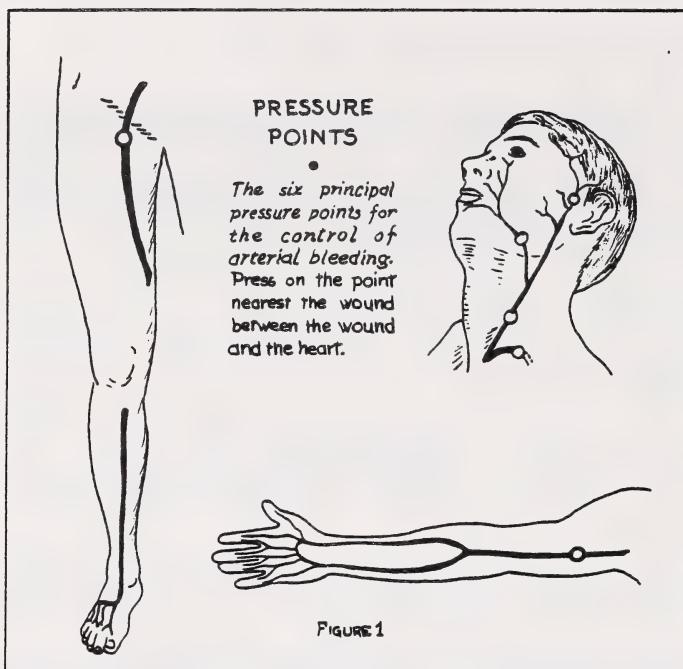
The blood from a capillary hemorrhage is red. It may flow briskly in a continuous stream or merely ooze from all parts of the wound.

Blood from a vein is dark red. It flows in a steady stream from the side of the wound further from the heart.

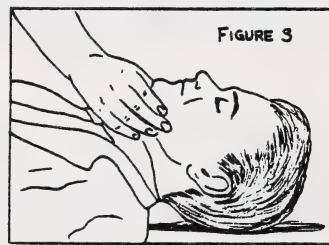
Bleeding from a vein can usually be stopped by applying pressure directly over the wound. To stop bleeding from an artery, pressure must usually be applied at a special pressure point.

A steady flow of dark red blood means a vein has been cut. The simplest way to stop bleeding is to apply pressure over the wound. A pressure dressing consisting of a thick pad of gauze, or other clean cloth, is placed over the wound and bandaged snugly in place with strips of cloth or adhesive. If bleeding is heavy, pressure with the hand over the compress may be applied. If all the materials for a pressure dressing are not available, place a cloth pad over the wound and apply pressure with the hand, or press with the fingers near the edges of the wound, until a pressure dressing can be obtained. If the bleeding is from an arm or leg, elevating the limb will help to control bleeding.

Blood flowing in quick spurts means that an artery has been cut. To stop bleeding from an artery, or to stop any bleeding that does not cease in five minutes after applying direct pressure over the wound, apply pressure over the appropriate pressure point. Pressure points are the spots where an artery crosses a bone. These places are in front of the ear, along the jawbone, on the side of the windpipe, behind the collar bone, inside the arm, and in the groin.



Bleeding of the head above the eyes  
Press just in front of the ear.



Bleeding of the cheek below the eyes  
Press in the notch on the side of the jawbone which is 1 inch to  $1\frac{1}{2}$  inches in front of the angle of the jaw.

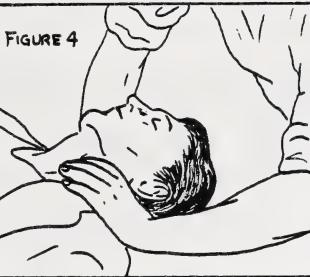


FIGURE 4

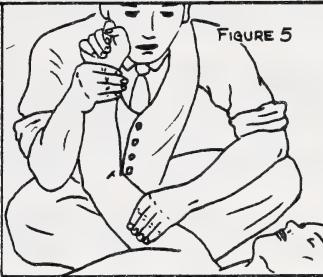


FIGURE 5

Bleeding from the neck or throat. Place your thumb against the back of the victim's neck and your fingers in the depression at the side of the windpipe (not over it), with one finger above the wound and one finger below it. Press the fingers and thumb toward each other.

Bleeding from the lower two thirds of the arm, and hand. Place your fingers halfway between armpit and elbow, on the inside of the arm, and press fingers and thumb toward each other with the arm bone between. (If the arm is fat, place your hand underneath it.)



FIGURE 6



FIGURE 6a

Bleeding from the shoulder, armpit, and upper part of arm. Place your thumb or fingers in the hollow behind the victim's collarbone, and press against the upper surface of the first rib.

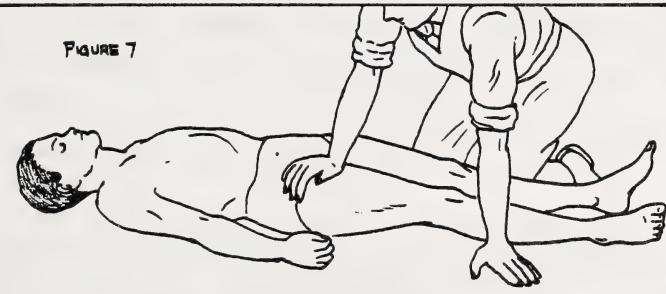


FIGURE 7

Bleeding from the thigh, leg, or foot. Place the heel of your hand just below the victim's groin at the point indicated, and press downward.

## HEALTH and GUIDANCE

## Medical Advances

## A. Research in Heart Disease

In recent years great progress has been made by medical investigators against heart disease. Many doctors now believe that exercise, graduated and progressive, taken in conjunction with diet is an effective method of controlling heart disease.

After an attack many doctors advocate exercise which is individually prescribed. They claim that exercise of the right kind makes the difference between a healthy heart patient and an unhealthy one.

Great strides have been made in controlling infections which are often the forerunners of heart disease. The crippling disease of children -- rheumatic fever -- which often follows "strep" throat has been reduced substantially through control of infections.

The techniques of modern surgery are curing the diseased hearts of both adults and children.

All heart operations are dramatic. One of the most fascinating is the correction of a tight valve in a rheumatic heart. Circulation through the heart is stopped for a short time and the left auricle is opened. A surgeon reaches into the valve and loosens it with a tiny knife fastened to the finger of his glove. The blood can then flow through the valve as it normally should.

Various operations have been tried and offer promise in repairing a damaged heart wall resulting from a coronary occlusion.

Some heart conditions are present at birth. These ailments are called congenital ailments. Great strides have been made in recent years in correcting these through heart surgery.

A remarkable heart-lung machine can be used as a temporary substitute for both the heart and the lungs. This machine oxygenates the blood and pumps it through the body. By using this device the heart can be a dry field for the surgeon to work on.

Medical scientists are in the midst of extensive research to find the causes and treatment of hardening of the arteries. Surgeons can now operate on diseased blood vessels. Diseased linings from arteries can be scraped off. A new smooth lining then forms. Nylon or plastic sections are used to replace damaged sections, -- even in the aorta.

## HEALTH and GUIDANCE

By producing hypertension (high blood pressure) in animals, much has been learned about this condition in humans. As a result special diets, operations, and pressure-lowering drugs have been developed and used with varying degrees of success.

From scientific studies of diets and drugs, scientists have gathered greater knowledge of atherosclerosis, a type of arterio-sclerosis. Anti-coagulants, substances to prevent the clotting of blood, are now available. Some have been developed in Canada. Patients suffering from coronary disease or stroke will benefit as both these conditions occur when blood vessels are blocked by clots.

### B. Heart Massage Combined with Mouth-to-Mouth Resuscitation

Over the past decade startling new surgical techniques have made heart operations which were previously never even thought of, possible. Medical men, however, acknowledge the fact that more people die after an operation than during one.

Patients leaving the operating room in hospitals specializing in heart surgery are taken to Intensive Care. This section is staffed by personnel especially trained in this work. Patients here are so carefully watched that only a very small percentage of these heart patients ever require emergency care.

A machine called a monitor shows the heartbeat of the patient on the screen.

Should the heart stop beating (a cardiac arrest) there is a maximum of four minutes in which to act.

If a cardiac arrest occurs, a doctor is at once summoned. One nurse massages the heart externally. She presses the heel of her left hand over her right hand and presses up and down. As she does this, another nurse, working in rhythm, applies mouth-to-mouth resuscitation.

About three minutes later, if the procedure has been successful, a faint heart beat is discernible. Had the patient not had immediate attention he would most certainly have died.

Before this system came into effect, had there still been time, the doctor on his arrival, would have made an incision in the patient's chest and by squeezing the heart in his hand would have tried to revive the heart.

## HEALTH and GUIDANCE

First-aid workers have practiced artificial respiration on drowning victims for years. But it is only during the last few years that this procedure has been used when working with people with failing hearts.

The pressure on the patient's chest has the effect of a massage as it squeezes the heart between the chest walls. This massaging, however, must be done in rhythm with another worker giving mouth-to-mouth resuscitation.

### C. Blood Banks and Transfusions

Not many years ago, a hospital patient was given a blood transfusion only if he was close to death. Now transfusions are given to avoid the problems which killed many patients in former years.

Whole blood transfusions are used in cases of severe loss of blood in an injury, hemorrhage, or in certain diseases which destroy blood cells. At one time whole blood was transferred from the donor to the recipient through a tube. More recently, blood was collected from the donor in a sterilized bottle and delivered to the patient. At the present time, we make use of blood stored in blood banks.

The Canadian Red Cross Society has organized a completely free National Blood Transfusion Service across Canada. It provides, free of charge, transfusion equipment and adequate supplies of whole blood and plasma to all Canadian hospitals on the understanding that this advantage will be passed on to the patients.

Blood is collected by the staffs at permanent clinics in the larger centers, and by the collecting teams in mobile units in rural areas. It is grouped and tested at central depots and then distributed to the hospitals on the basis of their requirements. Blood not used within 10 days is processed to plasma.

### D. Electrocardiograms

An electrocardiogram is a line picture of the heart action, produced by a delicate machine known as the electrocardiograph. Wires are attached to the patient. Through these wires, the impulses of electrical waves which are formed in the patient's heart, travel to the instrument. The instrument magnifies the impulses a thousandfold and makes a recording of them. By studying an electrocardiogram a doctor can diagnose a coronary occlusion.

## HEALTH and GUIDANCE

Exercise 1      First Aid for Bleeding

Answer the following questions in sentences.

1. a. How can bleeding from a vein usually be stopped?

---

- b. What color is venous blood?

---

2. a. What must often be done to stop bleeding from an artery?

---

- b. What color is arterial blood?

---

3. a. What are pressure points?

---

- b. How many pressure points are there?

---

- c. Where are these points located?

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

## HEALTH and GUIDANCE

Exercise 2

In your own words explain how each of the following contributes to the control or treatment of heart disease.

1. The heart lung machine \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. The experimental production of hypertension in animals \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. Anti-coagulants \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. The development of modern drugs to treat infection \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. Surgery \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
6. The development of synthetic substances such as nylon or plastic \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
7. Exercise and diet \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## HEALTH and GUIDANCE

8. A monitor \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
9. Mouth-to-mouth resuscitation \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
10. Electrocardiograms \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Exercise 3

Define the following terms.

1. arteriosclerosis \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. congenital \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. cardiac arrest \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. aorta \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. blood donor \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## HEALTH and GUIDANCE

Exercise 4 Blood Banks and Transfusions

Place a check mark (✓) beside correct answers.

1.  The Canadian Red Cross Society has organized a completely free National Blood Transfusion Service across Canada.  
 Blood which has been treated may be refrigerated.  
 Blood not used within a certain number of days is processed to plasma.  
 The proper type of whole blood must be used for every transfusion.  
 The proper type of plasma must be used for every transfusion.
2.  Blood is collected by the staffs at permanent clinics in the larger cities.  
 There are five main types of blood.  
 In rural areas mobile units collect blood.  
 Blood is grouped and tested at central areas.

Exercise 5 Electrocardiogram

Explain the difference between an electrocardiograph and an electrocardiogram.

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## HEALTH and GUIDANCE

## Unit III - The Nervous System

## Man's Marvellous Control System

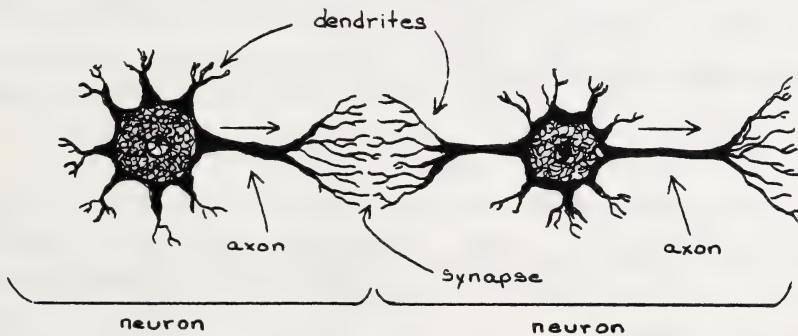
## A. Function

The body is a great community of units or systems working together. All units are regulated to function in harmony one with the other. The nervous system is the master, the co-ordinator, of all the activity in the body. It has the power to receive messages, and in accordance with the nature of the messages, to direct the proper organs to make the responses. The nervous system enables the individual to think, to reason, to rationalize, and to discriminate.

## B. Components

## 1. The neuron

The nervous system is made up of individual nerve cells called neurons. If a nerve cell is magnified 400 times it can be seen. Nerve cells differ greatly in form. For example, a nerve cell taken from your finger does not look at all like one taken from your brain. However, all nerve cells or neurons have certain things in common.



The cell body of the neuron is filled with a jelly-like fluid known as cytoplasm. Near the centre is a ball-shaped living structure, the nucleus. The cytoplasm and nucleus together are known as protoplasm, the basic substance from which all living things are formed.

## HEALTH and GUIDANCE

Dendrites are branches or processes which extend from the body of a neuron. Some dendrites are short and divided. Dendrites carry impulses toward the cell body.

One of the branches or processes is longer and less tapering than the dendrite. This is the axon which carries impulses away from the cell body.

Stretch out your hand and spread the fingers. A comparison between your hand and a neuron can be made if the fingers are imagined to be dendrites, the hand the cell body, and the arm the axon.

Messages pass from one neuron to another because the axon of one cell lies close to the dendrite of another. The gap which lies between an axon and dendrite is called a synapse. The synapse is the gateway through which messages must pass from one neuron to another. An impulse which must pass through a synapse may be compared to an electric current jumping a gap in a spark plug.

There are three kinds of neurons, -- sensory, motor, and association. Sensory neurons receive messages and carry them to a nerve centre. Motor neurons carry impulses from a nerve centre to a muscle or gland. Neurons which carry stimuli from sensory to motor neurons are called connecting or association neurons. These neurons, many of which are found in the brain, are responsible for thought, memory, and the higher mental functions. Animals have fewer association neurons than man. The lower the animal on the evolutionary scale, the fewer are the association or connecting neurons found in its nervous system.

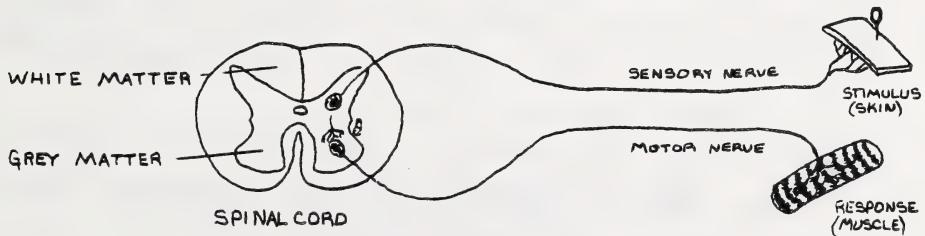
### 2. Nerves

The unit of nerve structure is the neuron with its network of branching nerve fibres. Nerves are made up of these fibres gathered together into cables. Each fibre is wrapped so that it is insulated from others in the cable and all are held together by connective tissue.

Nerves vary greatly in size. Some are fine hair-like structures; others are as thick as a pencil. The sciatic nerve is a good example of a large nerve in the body. Nerves carry messages in one direction only and they specialize in the messages they carry. For example, optic (eye) nerves respond to stimuli that give light messages, and the olfactory nerve responds to the stimuli that give us the sense of smell. Nerves branch from the brain, the spinal cord, and from other nerve centres or ganglia outside the brain and cord.

## HEALTH and GUIDANCE

Messages, such as those of fear and pain, must often be acted upon instantaneously if serious injury is to be avoided. Although the brain may be busy with other calls, it handles these urgent ones immediately. The resultant actions, which are called reflex actions, are not planned or willed as voluntary actions are. With many reflex actions, the message does not go all the way to the brain but instead is handled in the spinal cord. The sensory nerve impulse is sent back to the proper motor nerve without going through the exchange centre in the brain. Reflex actions are taking place all the time because the nervous system is ever on the alert to protect us from danger.



You might like to try this simple reflex action. Have someone sit, with legs crossed, and one foot swinging freely. Hit the leg lightly just below the kneecap with the edge of the hand.

The lower leg jerks upward. Striking the knee stimulates a sensory nerve which carries an impulse to the spinal cord. Here the impulse is sent to an association neuron, which in turn stimulates a motor neuron in the lower leg, causing it to jerk. The entire reflex action requires only a split second.

It might be of interest to note that nerve impulses travel at the rate of 268 miles per hour.

Some reflexes, such as blinking the eyes when something comes near them, are present from birth, but many, such as those involved in walking, driving a car, or playing a musical instrument are learned or acquired.

When you decide to learn something new, such as typing or swimming, your movements are awkward and unco-ordinated. This is so because impulses travelling over your nervous system do not at first know which pathway to select. They may try first one path-

## HEALTH and GUIDANCE

way and then another. When a route is found that gives the right response, the reaction experienced is a pleasurable one and so stimuli learn to take certain pathways. As the same movements are repeated over and over, the right response becomes almost automatic and the correct thing can be done easily and without thought.

In the process of learning, a chain of reflexes is established whereby certain stimuli call forth certain reactions. Because acquired reflexes or habits become almost automatic, they simplify life.

Habits free the mind for thought, for forming judgments, and for learning something new. A child soon puts the mechanics of walking, dressing, and writing on the habit basis. As he matures he places more and more activities on the automatic level.

If a person forms good habits, he experiences a feeling of security which eases tensions. Those who do not form good habits in personal care, in school work, and other activities, waste time and develop feelings of inferiority and frustration.

### 3. Divisions of the nervous system

The nervous system is made up of two circuits. One is the autonomic (self-directing) system which sends a stream of impulses to the vital organs. This system works without conscious will or thought. The other circuit is the central nervous system which makes possible all the higher functions of life, -- thought, learning, memory and judgment.

#### a. The autonomic nervous system

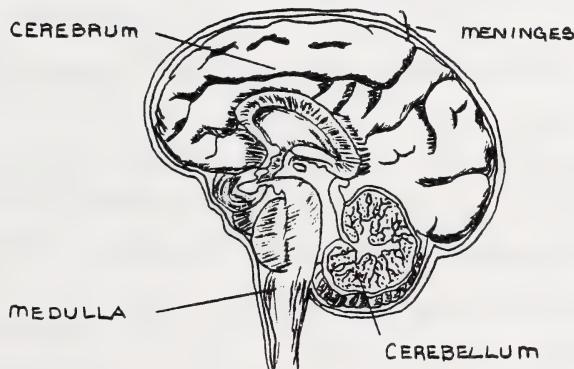
The autonomic nervous system controls the activity of the digestive system, the respiratory system, the glands of secretion, and the circulation of the blood. The autonomic system has two divisions, -- the parasympathetic and the sympathetic. The nerve fibres of the parasympathetic system branch from the brain portion of the central nervous system and from the lower part of the spinal cord. The nerve centres or ganglia that relay messages in this system are located near or in the affected organ. The nerve fibres of the other division, called the sympathetic system, branch from the middle section of the spinal cord. The ganglia, or relay stations, are arranged in a chain down each side of the spinal cord, but outside the spinal column.

The two systems have an antagonistic effect on each other. The parasympathetic system opposes the sympathetic system, and thus maintains a system of check and balance.

## HEALTH and GUIDANCE

## b. The central nervous system

The central nervous system is the headquarters for receiving messages from the outside world, such as those from sight, sound, taste, touch, and smell. It also governs your reactions to all these messages. This system also receives messages from the autonomous system when some conscious activity is necessary. For example, should you forget to eat breakfast, your autonomic system will later on in the morning, send distress signals to your central system. You will experience hunger pangs and you will look for something to eat.



The central nervous system consists of the cerebrum, the cerebellum, the medulla, and the spinal cord.

The cerebrum is the largest of the brain regions. Through the cerebrum we express our intellectual, spiritual, and moral values.

## HEALTH and GUIDANCE

The cerebellum is the "little brain" which lies below the back part of the cerebrum. In a sense the cerebellum acts as an assistant to the cerebrum in controlling muscular activity.

The medulla is located at the base of the skull and protrudes from the skull slightly where it joins the spinal cord. The medulla controls the activity of the internal organs. It regulates the rate of respiration and heart action, the muscular action of the walls of the digestive system, secretions in the glands, and other autonomic activities. Destruction of the medulla, of course, is fatal.

The spinal cord extends from the medulla through the protective bony arch of each vertebra. Spinal nerves branch off the spinal cord. In addition to linking the brain and the body, the spinal cord is the centre of reflex actions which have already been discussed.

If the spinal cord were cut, all parts of the body controlled by nerves below the point of severance would be totally paralyzed. Such an injury might be compared to cutting the main cable in a telephone exchange.

The cerebrum, cerebellum, medulla, and spinal cord are covered by three membranes called meninges. The space between the inner and middle membranes is filled with a thin liquid called cerebro-spinal fluid. This fluid serves the same purposes as do shock absorbers in a car.

Fractures of the skull and vertebral column are particularly serious because of possible damage to the brain or spinal cord. For this reason the victim of such an injury must not be moved until expert care can be given.

## HEALTH and GUIDANCE

Exercise 1 Function of the Nervous System

Fill in the blanks.

The body is a great community of \_\_\_\_\_ or \_\_\_\_\_ working together. All units must be regulated to function in \_\_\_\_\_ one with the \_\_\_\_\_. The nervous system is the \_\_\_\_\_, the \_\_\_\_\_, of all the activity in the body. It has the \_\_\_\_\_ to receive messages and in accordance with the nature of the \_\_\_\_\_ to direct the proper organs to make the \_\_\_\_\_. The nervous system enables the individual to \_\_\_\_\_, to \_\_\_\_\_, to \_\_\_\_\_, and to \_\_\_\_\_.

Exercise 2 The Neuron

If the statement is T (True) write T; if the statement is F (False) write F. Use the space provided.

- \_\_\_\_ 1. The nervous system is made up of individual nerve cells called neurons.
- \_\_\_\_ 2. Nerve cells differ only slightly in form.
- \_\_\_\_ 3. A nerve cell which has been magnified 200 times may be seen.
- \_\_\_\_ 4. All nerve cells have certain things in common.
- \_\_\_\_ 5. The nucleus of a nerve cell is a ball-shaped structure.
- \_\_\_\_ 6. Dendrites carry impulses toward the cell body.
- \_\_\_\_ 7. Axons carry impulses away from the cell body.
- \_\_\_\_ 8. The gap which lies between a dendrite and an axon is called a synapse.
- \_\_\_\_ 9. An impulse which must pass through a synapse may be compared to an electric current jumping a gap in a spark plug.

## HEALTH and GUIDANCE

Exercise 3      The Neuron

Complete the following sentences.

1. There are three kinds of neurons. They are \_\_\_\_\_ ,  
\_\_\_\_\_, \_\_\_\_\_ .
2. Sensory neurons receive \_\_\_\_\_ .
3. Motor neurons carry \_\_\_\_\_ .
4. Association neurons carry stimuli \_\_\_\_\_ .
5. Association neurons are responsible for \_\_\_\_\_ .
6. Animals have fewer association \_\_\_\_\_ .

Exercise 4      Nerves

Match the predicates in Column B with the subjects in Column A. Place the letter of your choice in the space provided.

- | Column A                                  | Column B                                                         |
|-------------------------------------------|------------------------------------------------------------------|
| _____ The unit of nerve structure         | a. is insulated from others in the cable.                        |
| _____ Each fibre                          | b. responds to stimuli from light messages.                      |
| _____ The sciatic nerve                   | c. is ever on the alert to protect us from danger.               |
| _____ The optic nerve                     | d. is the neuron with its network of branching fibres.           |
| _____ The olfactory nerve                 | e. responds to stimuli that give us the sense of smell.          |
| _____ Reflex actions                      | f. are handled in the spinal cord.                               |
| _____ The messages in many reflex actions | g. are made up of bundles of fibres gathered together in cables. |
| _____ The nervous system                  | h. protect us from danger.                                       |
| _____ Nerves                              | i. is a good example of a large nerve in the body.               |

## HEALTH and GUIDANCE

Exercise 5

Answer in sentences.

1. What reflex is present at birth?

---

---

2. Are many or few reflexes learned or acquired?

---

3. What are your movements like when you first try to learn something new?

---

---

4. Why is this so?

---

---

5. How do impulses travelling over the nervous system find the pathway that gives a pleasurable response?

---

6. When do responses become almost automatic?

---

---

7. In learning, certain stimuli call forth certain reactions. What has been established?

---

---

8. Why do acquired reflexes or habits simplify life?

---

## HEALTH and GUIDANCE

9. Why are habits valuable assets?

---

---

10. How can a feeling of security which eases tensions be acquired?

---

Exercise 6      Divisions of the Nervous System

Multiple choice. Place (✓) opposite statements which are true.

1. The autonomic nervous system

- \_\_\_\_\_ controls the digestive system, the respiratory system, and the circulatory system.
- \_\_\_\_\_ has two divisions -- parasympathetic and sympathetic.
- \_\_\_\_\_ sends a stream of impulses to the vital organs.
- \_\_\_\_\_ works without conscious will or thought.

2. The central nervous system

- \_\_\_\_\_ consists of the cerebrum, cerebellum, the medulla, and the spinal cord.
- \_\_\_\_\_ is the headquarters for receiving messages from the outside world, such as those of sight, sound, taste, and touch.
- \_\_\_\_\_ governs reactions to messages from the outside world.
- \_\_\_\_\_ also receives messages from autonomic system.
- \_\_\_\_\_ governs respiration, digestion, and the circulation of blood.

## HEALTH and GUIDANCE

## 3. The cerebrum

- \_\_\_\_\_ is the smallest of brain regions.
- \_\_\_\_\_ is part of the central nervous system.
- \_\_\_\_\_ is the part through which intellectual, spiritual and moral values may be expressed.
- \_\_\_\_\_ has an assistant.

## 4. The cerebellum

- \_\_\_\_\_ is the largest of the brain regions.
- \_\_\_\_\_ assists the cerebrum in controlling muscular activity.
- \_\_\_\_\_ is the little brain.

## 5. The medulla

- \_\_\_\_\_ is located at the base of the skull.
- \_\_\_\_\_ controls the activity of the internal organs.
- \_\_\_\_\_ regulates the rate of respiration.
- \_\_\_\_\_ regulates heart action.
- \_\_\_\_\_ is the centre of reflex actions.
- \_\_\_\_\_ regulates secretions in the glands.
- \_\_\_\_\_ regulates muscular action of the walls of the digestive system.

## 6. The spinal cord

- \_\_\_\_\_ extends from the cerebellum through the protective bony arch of each vertebra.
- \_\_\_\_\_ links the brain to the body.
- \_\_\_\_\_ is the centre of reflex actions.
- \_\_\_\_\_ may be compared to the main cable of a telephone exchange.



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## HEALTH and GUIDANCE

### Diseases and Disorders of the Nervous System

#### A. Poliomyelitis

Polio virus damages or destroys the cell bodies in the spinal cord. These nerves control movements below the neck. Polio is not a disease of the muscles although its effects show there. If the number of nerve cells involved is slight, only mild and relatively brief muscle weakness develops. If many motor nerve cell bodies are entirely destroyed, the muscles they control become permanently paralyzed.

#### B. Cerebral Hemorrhage (stroke)

Paralytic stroke and apoplexy are familiar names for a condition doctors call cerebral hemorrhage, which is the result of a blood vessel bursting in the brain or on its surface.

A hemorrhage may occur anywhere in the brain. Bleeding continues until a clot forms. The clot usually deep in the brain, in the region of fibres leading from the motor area, causes pressure on these nerves. The interruption of impulses along these nerves results in paralysis of the muscles they control.

A person can recover from cerebral hemorrhage, if the bleeding stops before the pressure of the blood clot destroys the function of the medulla and paralyzes the vital organs it controls.

#### C. Concussion

A concussion is a brain bruise caused by a sudden jolt, or a blow to the head. Usually it is not serious but the patient must be kept quiet for a few days. Inactivity holds the blood pressure down and allows the brain shock to subside. Headaches and vomiting are common symptoms of brain concussion.

#### D. Encephalitis

Encephalitis is a virus disease of the nerve fibres of the mid-brain. The mid-brain is composed of fibres which connect the cerebrum to the cerebellum. In 1915 a dangerous epidemic form of encephalitis appeared. Because patients sank into a deep sleep or coma, the disease was given the name of sleeping sickness. Several different viruses including those which cause measles and mumps may cause encephalitis. This disease can be acute and last

## HEALTH and GUIDANCE

only a short time or it may be chronic and last for years. In its acute form it causes headache, sleepiness during the day, restlessness at night, blurred or double vision. Coma may occur.

### E. Tumors of the Brain and Spinal Cord

A tumor is an abnormal growth which may become cancerous. The location of the tumor determines the symptoms of the disease. A tumor may develop in the brain. Such a tumor can often be removed by brain surgery. However, if it lies too deep removal is impossible.

A tumor on the spinal cord may cause pressure on the nerve trunks and paralyze the body below the tumor. A spinal tumor is more easily removed than a brain tumor. Successful surgery removes pressure from the nerve trunks and may restore the function of the paralyzed parts.

### F. Multiple Sclerosis

Multiple sclerosis baffles medical science. For some unknown reason scattered islands or patches of nerve fibres in the brain and spinal column harden and die. The condition may appear suddenly and develop rapidly. Usually, however, the islands form gradually and the disease may last for twenty-five years or more.

The symptoms depend on the location of the hardened areas. Symptoms include "pins and needles", dizziness, and numbness of the hands and feet. Vision may be blurred; speech may become slow and hesitant. When motor areas are affected, paralysis which may confine the victim to bed or to a wheelchair results. In spite of serious handicaps many victims of slowly progressing multiple sclerosis continue to lead useful lives.

### G. Fractures of the Skull

Fractures of the skull and vertebral column are particularly serious because of possible damage to the brain or spinal cord. For this reason the victim of such an injury should not be moved until expert care can be given.

### H. Cerebrospinal Meningitis

The name tells you that the disease is an infection of the meninges (membranes) of the brain and spinal cord. Several types of bacteria may cause this trouble. Epidemic meningitis is spread in discharges from the nose, throat, and eyes. As in polio, the

## HEALTH and GUIDANCE

disease can be spread by human carriers, who themselves do not have the disease. Most cases are in children and teenagers. In past years a serum greatly reduced the death rates. Germ-killing drugs, recently discovered, have reduced the death rate even further.

### I. Cerebral Palsy

Cerebral palsy may be caused by brain damage before, during, or after birth. The cranial bones in a baby's head are soft and pliable and easily injured. Sometimes, during birth, the motor areas are damaged by pressure. The result is a type of paralysis which we call cerebral palsy.

Children with this disease can be given special treatments to re-train paralyzed muscles and restore control in the brain. Various kinds of exercises, massage, and special kinds of walking devices are included in the treatment.

### J. Neuritis

Neuritis is the most common ailment of nerves themselves. It is an inflammation of the sheath around a nerve fibre. Pain is produced if a sensory nerve is involved. A common cause of neuritis is lack of vitamin B<sub>1</sub> in the diet. Another cause is infection. Still another is lead poisoning.

### K. Shingles

Shingles is the inflammation of a sensory nerve ganglia. It is caused by a virus related to the one which causes cold sores. Inflammation causes pain and blisters in the area of skin supplied by the nerve.



## HEALTH and GUIDANCE

Exercise 1      Injuries to the Nervous System

Fill in the blanks.

1. Polio virus destroys cell bodies in the \_\_\_\_\_.
- Polio is not a disease of the \_\_\_\_\_ although its effects show there.
2. A cerebral hemorrhage occurs when a \_\_\_\_\_ bursts in the brain or on its surface. Bleeding continues until a blood clot forms. The clot, usually deep in the brain, \_\_\_\_\_ on motor areas and causes \_\_\_\_\_.
3. A concussion is a brain \_\_\_\_\_ caused by a blow on the \_\_\_\_\_ or a sudden \_\_\_\_\_. The patient must be kept \_\_\_\_\_ for a time. This holds the \_\_\_\_\_ down and allows the brain shock to subside.
4. Encephalitis is a virus disease of the nerve fibres of the \_\_\_\_\_. This disease may be \_\_\_\_\_ and last only a short time or it may be \_\_\_\_\_ and last for years.
5. A tumor is an \_\_\_\_\_ growth. It may be cancerous. A tumor may develop in the \_\_\_\_\_ or \_\_\_\_\_. The location of the tumor determines the \_\_\_\_\_ of the disease. A \_\_\_\_\_ on the spinal cord may cause \_\_\_\_\_ on a nerve trunk and \_\_\_\_\_ the body below it.
6. Multiple sclerosis baffles \_\_\_\_\_. Scattered islands or patches of \_\_\_\_\_ in the brain and spinal cord harden and die. When motor areas of the brain are involved \_\_\_\_\_ results.

## HEALTH and GUIDANCE

7. Neuritis is an inflammation of the sheath around a \_\_\_\_\_.  
 \_\_\_\_\_ . A common cause of \_\_\_\_\_ is a lack  
 of Vitamin B<sub>1</sub>. Other causes are \_\_\_\_\_ and  
 \_\_\_\_\_.
8. Shingles is an \_\_\_\_\_ of a sensory nerve ganglia.  
 The disease is caused by a virus related to the one which causes  
 \_\_\_\_\_. Inflammation causes \_\_\_\_\_  
 and \_\_\_\_\_ in the area of skin supplied by the nerve.

Exercise 2

Match sentence fragments in Column A with sentence fragments in Column B to make complete statements. Place letter of your choice in space provided.

Column A	Column B
_____ Polio virus	a. makes fracture of skull and vertebral column very dangerous.
_____ In cerebral hemorrhage	b. an infection of the meninges of the brain and spinal cord.
_____ Possible damage to the brain or spinal cord	c. spread by human carriers.
_____ Meningitis is	d. a blood clot usually forms deep in the brain.
_____ Meningitis can be	e. destroys motor nerve cell bodies in the spinal cord.
_____ Cerebral palsy may be	f. an inflammation of the sheath around a nerve fibre.
_____ Children with cerebral palsy can be	g. lack of Vitamin B <sub>1</sub> .
_____ Neuritis is	h. caused by brain damage before, during, or after birth.
_____ A common cause of neuritis is	i. the inflammation of a sensory nerve ganglia.
_____ Shingles is	j. given special treatments to re-train paralyzed muscles and restore control in the brain.

## HEALTH and GUIDANCE

Exercise 3

Answer in sentences.

1. If muscles are paralyzed what nerves have been damaged?

---

---

2. In cerebral hemorrhage or stroke what causes paralysis?

---

---

3. If the function of the medulla is destroyed, why is recovery from cerebral hemorrhage not possible?

---

---

4. Following a concussion why must a patient be kept quiet?

---

---

5. Why might a tumor on the spinal cord cause paralysis of the body below the tumor?

---

---

6. In multiple sclerosis if paralysis occurs what area of the brain has been affected?

---

---

**HEALTH and GUIDANCE**

7. Why are fractures of skull and vertebral column particularly serious?

---

---

8. In cerebral palsy how are motor areas damaged?

---

---

9. What is a common cause of neuritis?

---

---

10. To what virus is the virus which causes shingles related?

---

---

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**ALBERTA CORRESPONDENCE SCHOOL**  
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## HEALTH and GUIDANCE

## Unit IV - The Endocrine System

## Introduction

The ductless or endocrine glands form an intricate body system. These glands pour their secretions directly into the blood stream. These secretions contain hormones which are chemical regulators of the body. Hormones have a powerful effect on the activity of certain organs and tissues. A normal person must have a proper supply of hormones in his body. If a gland secretes too much hormone, this causes one kind of abnormal condition. If, however, the gland secretes too little hormone, this causes an abnormal condition of the opposite kind.

## Structure, Location and Function of the Glands

## A. Pituitary - The Mighty Midget

The pituitary gland, a tiny gland no larger than the end joint of the little finger, lies at the base of the brain, not far from the root of the nose.

This little endocrine gland secretes hormones which influence the activity of other glands. Scientists have recently discovered that other glands may influence the pituitary. The pituitary, once thought to be the master gland, is now considered by scientists to be a vital link in a delicate check-and-balance system in which all the endocrine glands are involved.

The pituitary gland has two main parts called the anterior and posterior lobes. Each lobe manufactures a number of different hormones that have distinct and powerful functions. One of the hormones manufactured by the pituitary influences growth. If the gland produces too much of this substance, growth is excessive. Little growth takes place if the gland does not secrete enough.

Other hormones manufactured by the pituitary stimulate the thyroid to greater activity, influence the adrenal glands, the gonads (sex glands) and act upon insulin produced by the pancreas. One of the hormones manufactured by the anterior lobe of the pituitary is ACTH, an extremely powerful hormone. Doctors use this hormone with great caution when treating diseases of the rheumatic group.

## HEALTH and GUIDANCE

## B. Thyroid

Perhaps the best known of the endocrine glands is the thyroid. This gland is shaped like a horseshoe and is about the size of the thumb. It is wrapped around the voice-box and the windpipe. The thyroid secretes a hormone known as thyroxine, a substance rich in iodine. Thyroxine influences the rate at which food burns in the body. If there is too much thyroxine, the food burns too fast and the person affected is likely to be thin and nervous. If there is too little, the person is apt to be heavy and inactive.

## C. Parathyroids

Attached to the back of the thyroid gland are four little glands known as the parathyroids. These glands bear no relation to the thyroid except in position. The tiny parathyroids secrete a powerful hormone which controls the use of hormones in the body. If these glands are removed, the amount of calcium in the body falls and the patient affected goes into convulsions. The doctor, operating on the thyroid, takes every precaution to protect the parathyroids, for without these glands life is impossible.

## D. The Adrenals

An adrenal gland sits, like a miniature cocked hat, on top of each kidney. Together, these tiny glands weigh no more than one quarter of an ounce. The adrenals consist of a thick outer part which is known as the cortex. The small inner part is called the medulla. The cortex and the medulla are actually two separate glands which happen to be fastened together. The medulla secretes a hormone known as adrenalin which acts upon all parts of the body controlled by the sympathetic nervous system, a part of the autonomic system. Adrenalin prepares the body to meet emergencies. It stimulates the liver to release sugar when extra energy is needed. When the person has need for an extra supply of blood, adrenalin acts on the heart to increase the force of its beat and to raise the blood pressure. Adrenalin, extracted from the glands of animals, is used in emergencies, particularly in relieving severe asthmatic conditions and in acting as a powerful stimulant for the heart.

The cortex, the outer portion of the adrenal gland, is believed to be the most important part of the adrenal body. The cortex manufactures a variety of hormones absolutely essential to life. These hormones help the body to meet shock and stress and exert an influence on the composition of the blood. This gland is the chief source of sex hormones.

## HEALTH and GUIDANCE

A very powerful chemical substance known as cortisone has been extracted from the adrenal cortex of animals and is being tried out in a number of diseases. Cortisone seems to be related to ACTH. Both these powerful drugs are being cautiously used to treat rheumatic disease, skin inflammation, and allergies.

### E. The Pancreas

The pancreas, a double gland, lies just behind the stomach. The largest part of this gland manufactures pancreatic juice which aids in digestion.

Hidden in the interior of the pancreas are scattered cells known as "the islands of Langerhans". Together these cells compose a gland which secretes insulin. Insulin is needed to promote the burning of sugar in the body. When no insulin is secreted, a disease known as diabetes results.

### F. Gonads

Gonads which are sex glands begin to function at puberty. At this time they produce a sudden spurt in growth and then gradually bring about the many changes that take place when a girl becomes a woman, and a boy becomes a man.

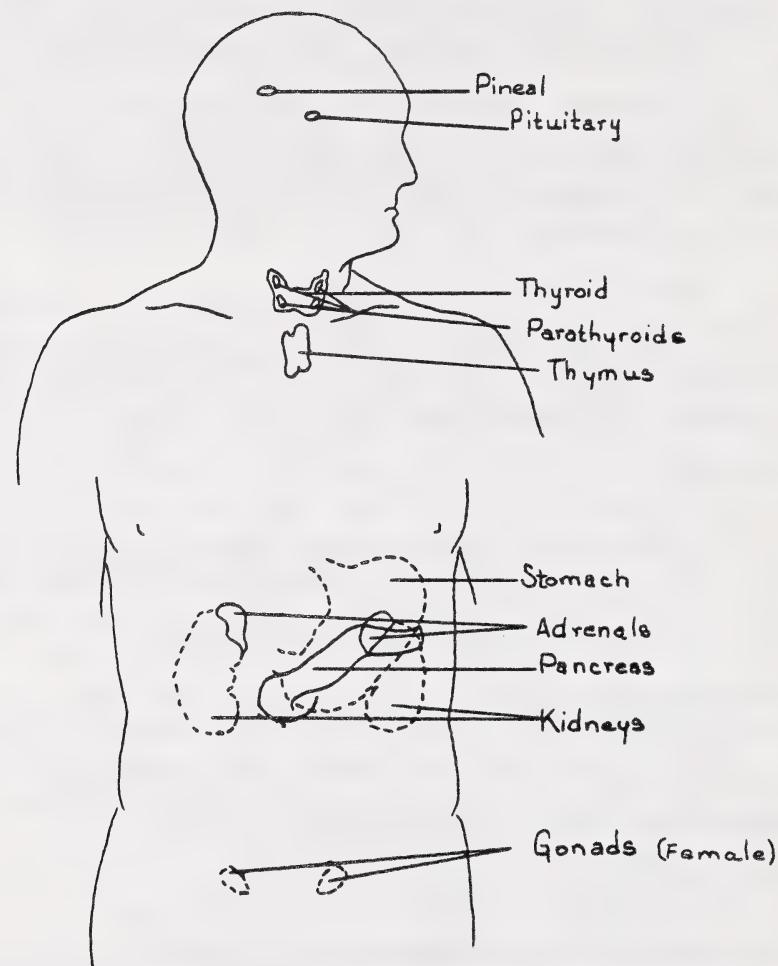
### G. The Thymus

The thymus gland is situated between the lungs. It influences growth in the young and then at puberty wastes away. Little is known about the function of this gland.

### H. The Pineal

This little cone-shaped gland is less than half an inch in length. It is attached to the lower side of the brain between the cerebral hemispheres. The pineal reaches its largest size at the seventh year and then like the thymus disappears during adolescence.

## HEALTH and GUIDANCE



**HEALTH and GUIDANCE****Diseases and Disorders****A. Dwarfs and Giants**

One of the hormones manufactured by the pituitary influences growth. If too much of this substance is produced, growth is excessive. If too little is produced, growth is correspondingly restricted. Disturbances in the pituitary gland are responsible for the abnormal size of giants and dwarfs.

**B. Cretinism**

The thyroid gland produces thyroxine. Lack of thyroxine in young children produces cretins. Cretins are deformed little people who are heavy, sluggish, and mentally slow. If the deficiency in thyroxine is recognized early, cretins can become normal individuals by taking a thyroid extract obtained from animals slaughtered for their meat.

**C. Goitre**

The thyroid gland produces a hormone known as thyroxine which is rich in iodine. When the gland cannot obtain enough iodine, it enlarges in an effort to make more secretions to meet the demands of the body. The enlarged gland is called simple goitre. A person with simple goitre can prevent further increase in the size of the gland by taking iodine as prescribed by his doctor. Surgery, however, may be necessary to return the gland to normal size.

**D. Tetany**

If the parathyroid glands are underactive, the level of calcium in the blood falls and the muscles develop painful spasms called tetany.

**E. Diabetes**

The "islands of Langerhans" in the pancreas secrete a hormone known as insulin. Without insulin the cells can neither take sugar from the blood and use it as a fuel nor can they store sugar. Although the blood is full of sugar, tissues starve. The disease caused by a lack of insulin is known as diabetes.

Diabetes is not the hopeless disease it once was. Insulin which is extracted from the pancreas of animals can be given by means of a hypodermic needle or it can be taken in tablet form.



## HEALTH and GUIDANCE

Exercise 1 Introduction

Fill in the blanks with suitable words chosen from your notes.

The ductless or \_\_\_\_\_ glands form an intricate body  
\_\_\_\_\_. These glands pour their secretions \_\_\_\_\_  
into the blood stream. The endocrine secretions contain \_\_\_\_\_  
which are chemical \_\_\_\_\_ of the body. Hormones have a  
powerful \_\_\_\_\_ on the activity of certain \_\_\_\_\_ and  
\_\_\_\_\_. A \_\_\_\_\_ person must have a  
\_\_\_\_\_ supply of hormones in his body. If a gland secretes  
\_\_\_\_\_ hormone this causes an \_\_\_\_\_  
condition. If a gland secretes \_\_\_\_\_. \_\_\_\_\_ it causes an  
abnormal condition exactly \_\_\_\_\_ in nature.

Exercise 2 Structure, Location and Function of the Glands

Answer T if the statement is true; answer F is the statement is false. Use the space provided.

- \_\_\_\_ 1. The pituitary, one of the endocrine glands, secretes hormones which influence the activity of other glands.
- \_\_\_\_ 2. The pituitary was once thought to be the master gland.
- \_\_\_\_ 3. The pituitary is considered to be a vital link in a check-and-balance system in which all glands are involved.
- \_\_\_\_ 4. The pituitary gland is a large gland.
- \_\_\_\_ 5. The pituitary gland has two main parts, called the anterior and posterior lobes.
- \_\_\_\_ 6. One of the hormones manufactured by the pituitary influences growth.

**HEALTH and GUIDANCE**

- \_\_\_\_\_ 7. One of the hormones produced by the pituitary is ACTH which is used in treating diseases of the rheumatic group.
- \_\_\_\_\_ 8. The least known of the endocrine glands is the thyroid gland.
- \_\_\_\_\_ 9. The thyroid gland secretes a hormone known as thyroxine.
- \_\_\_\_\_ 10. Thyroxine influences the rate at which food is burned in the body.

**Exercise 3**

Answer in sentences.

1. Where are the parathyroid glands located?
- 

2. Why does a doctor protect the parathyroids when performing an operation on the thyroid?
- 

3. Where are the adrenal glands located?
- 

4. What hormone does the medulla of the adrenal secrete?
- 

5. a. Which part of the adrenal body is more important?
- 

- b. Why?
- 

- c. In what particular emergencies is adrenalin used?
-

## HEALTH and GUIDANCE

6. a. Where are "the islands of Langerhans" found?

---

- b. What hormone do they secrete?

---

- c. When no insulin is secreted what disease results?

---

7. Which glands begin to secrete at puberty?

---

8. What is known about the function of the thymus gland?

---

Exercise 4      Disease and Disorders

Complete the sentences.

1. Some disturbance of the pituitary gland is responsible for the abnormal size of \_\_\_\_\_.

2. a. The thyroid gland produces \_\_\_\_\_.

- b. Lack of thyroxine in young people produces: \_\_\_\_\_.

- c. Cretins are \_\_\_\_\_.

3. a. The \_\_\_\_\_ gland produces thyroxine..

- b. Thyroxine is rich in \_\_\_\_\_.

- c. When the thyroid cannot obtain sufficient iodine \_\_\_\_\_.

- d. The enlarged gland is called \_\_\_\_\_.

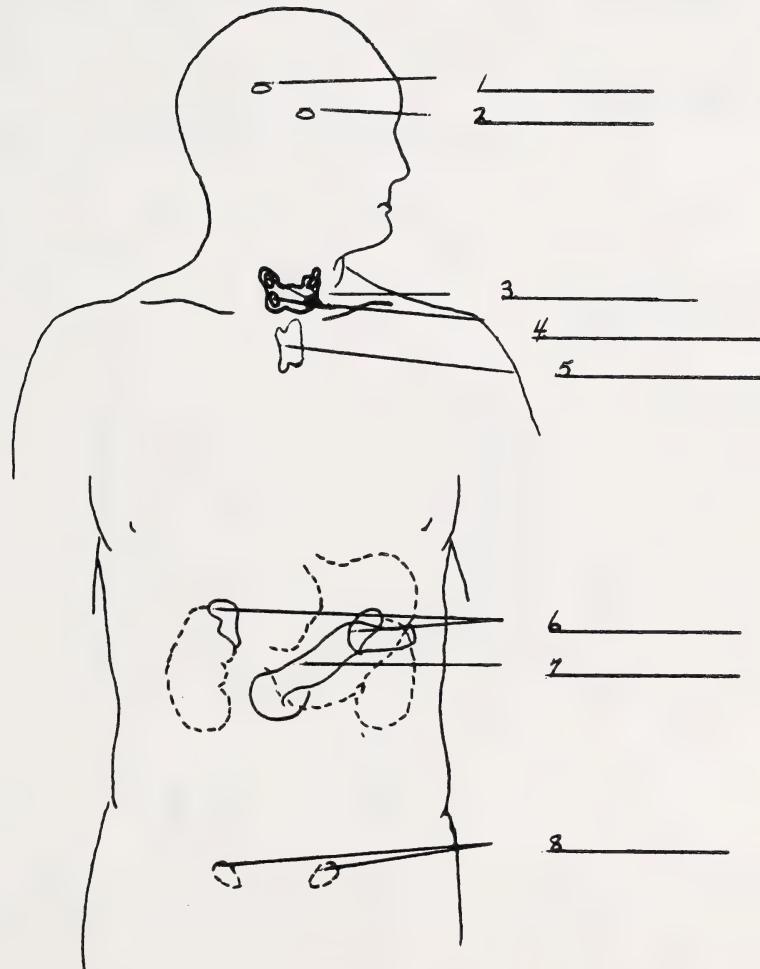
## HEALTH and GUIDANCE

4. If the parathyroids are underactive, the level of calcium in the blood falls and the muscles \_\_\_\_\_  
\_\_\_\_\_.
5. a. The "islands of Langerhans" located in the pancreas secrete a hormone known as \_\_\_\_\_.  
b. Without insulin the body cannot \_\_\_\_\_.  
c. Diabetes is not the hopeless disease it once was. Insulin extracted from the pancreas of animals can \_\_\_\_\_.  
\_\_\_\_\_.

## HEALTH and GUIDANCE

Exercise 5      Diagram

Glands on the chart have been numbered. In the spaces provided write the name of the gland which corresponds with the number.





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**HEALTH and GUIDANCE****Unit V - Safety on Wheels and on Water****Safety on the Highway****A. Preview**

More and more Canadians are driving cars and enjoying the convenience, comfort, and diversion which comes with driving one's own car. However, driving can add to life something very different and very terrifying -- sudden death or disability. Nine Canadians die in traffic accidents every day. More than 8 are injured, some severely, every hour. One motor vehicle accident occurs every minute.

The number of cars, the number of drivers, increasing power of cars and higher speed limits can produce an even greater death toll unless we educate the young drivers who are going to be behind the wheels of tomorrow's cars.

**B. Teen-age Drivers**

At the age of fourteen, if he can pass a written test based on the Alberta Driver's Manual, a student may obtain a Learner's Licence. At sixteen, if he can pass the road test, he can get his Driver's Licence.

Although it cannot be said that all teen-age drivers are reckless, statistics do show that these young people have more than their share of accidents. More than one out of five persons fatally injured in automobile accidents are between 15 and 24 years of age.

Older drivers are involved in fewer fatal accidents than are young people. When the deaths per million miles driven are considered, drivers aged 45 to 50 have the best record. Those under the age of twenty have the poorest. In fact, 16-year-old drivers have nine times, and 17 to 20-year-old drivers have five times as many accidents as drivers between 45 and 50.

Because young people can see better, hear better, and react faster they should be safer drivers. Why, then, are they not safer drivers? Although young people can handle cars well they lack experience and judgment. Many of them lack emotional control.

## HEALTH and GUIDANCE

It is of the utmost importance, that, if a teen-ager is going to drive a car, he should be trained to do so correctly. Where driving courses have been offered as high school subjects their value has been proved. In a study made, only 3.8 per cent of the boys who had had special driver training were involved in accidents over a period of 18 months. For students without such training the figures were almost doubled. In this group 6.6 per cent of the boys and .9 per cent of the girls had accidents.

Some young drivers feel unsure of themselves and because of this they have a tendency to show-off. A course in driving gives them the needed self-confidence and the urge to show-off vanishes. They are then safer drivers.

### C. The Relation of the Driver to Accidents

#### 1. Things Which Affect the Driver

##### a. Physical handicaps

An applicant for a driver's licence is checked for defects in his eyesight and hearing and for physical handicaps. To compensate for defects, a driver may have to wear glasses, use a hearing aid, have a special rear-view mirror, a knob on the steering wheel, or other special devices. Certain disabilities which are non-compensable may prevent a person from obtaining a licence. Among these disabilities are epilepsy, insanity, paralysis, and some types of heart trouble.

Authorities report that in about one out of fourteen fatal accidents some physical defect of the driver was thought to have been responsible. Going to sleep at the wheel or fatigue caused three fifths of the fatalities. Other defects responsible, were impaired vision, impaired hearing, and illness. It has been found that compensable drivers using special devices are involved in very few accidents.

Fatigue may catch up with anyone who fails to give his body sufficient rest. It is common sense to pull to the side of the road and rest if one feels drowsy. The driver who goes to sleep at the wheel threatens other lives as well as his own.

## HEALTH and GUIDANCE

## b. Attitudes

The car, the road, or the weather are not too often responsible for accidents. The fault more often lies with the driver. There are several well-marked types of problem drivers.

The self-centred driver ignores traffic lights, signs and rules when he can. When he parks he does so to suit himself. Others are not given consideration.

The indifferent driver does not bother to learn to drive well. Some authorities feel that inattention is a factor in at least half of the accidents.

The driver who lacks emotional control, honks the horn, shouts at other drivers.

The show-off is responsible for giving young drivers a bad reputation.

## c. Reaction time

The time that elapses between the instant you perceive a situation that calls for you to perform a simple action and the time it takes your muscles to perform that action is your reaction time. The normal time for a simple response to a stimulus is half a second or less. If you have to choose between two different actions your reaction time is greater. Some people react more quickly than others. Your reaction time varies with your health and alertness but no one ever reacts instantly. During your reaction time the car continues to travel. Should your brakes be weak, more time is consumed and the car remains in motion. If the pavement is slippery the car covers even a greater distance.

Stopping the car involves your reaction time, your car, and road and weather conditions. When all these things are taken into consideration, you can judge the speed at which driving may be considered safe.

## d. Alcohol

Authorities report that in about 22 out of 100 fatal accidents the driver or a pedestrian had been under the influence of liquor. Anyone whose judgment has been impaired by the use of alcohol should never take his place behind the wheel.

## HEALTH and GUIDANCE

## D. Safe Automobiles

The modern automobile is safety-engineered and designed for ease in handling. Power brakes, power steering, shatter-proof glass, padded dash, seal-beam headlights, signal lights, puncture-proof tires, tubeless tires, automatic dimmers, safety locks on doors, and better visibility have increased safety in the operation of a car. Scientific research and controlled tests have proved that some 500 Canadians would stay alive each year if everyone riding in a car was compelled by law to wear a seat belt. Seat belts are now standard equipment and the wearing of seat belts when driving is compulsory in most provinces.

Three out of four accidents occur within 40 km of home. Half of all road accidents involving injury or death occur at a speed of 64 km. per hour or less. Wear a seat belt, even when driving to the corner store.

## HEALTH and GUIDANCE

Exercise 1 Preview

Fill in the blanks with suitable words chosen from your notes.

More and more Canadians are driving cars and enjoying the

\_\_\_\_\_ , \_\_\_\_\_ , and \_\_\_\_\_

which comes with driving one's own car. However, driving can add

something very different and very terrifying -- \_\_\_\_\_

or \_\_\_\_\_. \_\_\_\_\_ Canadians die in traffic

accidents \_\_\_\_ day. More than 8 are \_\_\_\_\_, some

severely, every hour. One motor vehicle accident happens every

\_\_\_\_\_ .

The \_\_\_\_\_ of cars, the \_\_\_\_\_ of drivers,  
increasing \_\_\_\_\_ of cars, and \_\_\_\_\_ speed limits  
can produce an even greater \_\_\_\_\_ toll unless we \_\_\_\_\_  
the young drivers who are going to be behind the \_\_\_\_\_ of  
tomorrow's cars.

Exercise 2 Teen-age Drivers

If the statement is T (True) mark T; if the statement is F (False) mark F. Use the space provided.

- \_\_\_\_ 1. A student may obtain a Learner's Licence at fourteen if he can pass the written test based on the Alberta Driver's Manual.
- \_\_\_\_ 2. At fifteen, if he can pass the road test he can obtain his Driver's Licence.
- \_\_\_\_ 3. All teen-age drivers are reckless.
- \_\_\_\_ 4. Statistics show that teen agers have more than their share of accidents.
- \_\_\_\_ 5. More than one out of five persons fatally injured in car accidents are between the ages of 15 and 24.

## HEALTH and GUIDANCE

- \_\_\_\_\_ 6. Drivers between 45 and 50 have the best record.
- \_\_\_\_\_ 7. A teen-age driver should be trained to drive.
- \_\_\_\_\_ 8. Students who have taken driving courses have fewer accidents than those who have not.
- \_\_\_\_\_ 9. Because some young drivers feel unsure of themselves they have a tendency to show-off.
- \_\_\_\_\_ 10. A course in driving gives a teen ager self-confidence. His need to show-off vanishes.

Exercise 3      The Relation of the Driver to Accidents

Answer the questions in sentences.

1. For what three things is an applicant for a driver's licence checked?

---

---

2. In what ways may a driver compensate for his handicaps?

---

---

3. Persons with certain disabilities cannot obtain a licence. What are the disabilities?

---

---

4. Are compensable drivers involved in many accidents?

---

---

5. If a driver feels drowsy, what is the sensible thing for him to do?

---

---

## HEALTH and GUIDANCE

6. What things are not too often responsible for accidents?

---

---

7. Who is often at fault when an accident occurs?

---

---

8. Whenever he can, what traffic regulations does the self-centred driver ignore?

---

---

9. What does the driver who lacks emotional control do?

---

---

10. Who is responsible for giving teen agers a bad reputation?

---

---

11. What is the normal reaction time to a stimulus?

---

---

12. Does a person react instantly to a stimulus?

---

---

13. The time it takes to stop a car involves three things. What are they?

---

---

## HEALTH and GUIDANCE

14. Drivers or pedestrians who have been drinking are involved in what per cent of fatal accidents?

---

---

Exercise 4

Match the predicates in Column B with the subjects in Column A to make true statements. Place the letter of your choice in the space provided.

## Column A

- \_\_\_\_\_ The modern automobile  
\_\_\_\_\_ The use of seat belts  
\_\_\_\_\_ Three of four accidents  
\_\_\_\_\_ Half of all road accidents  
\_\_\_\_\_ A seat belt

## Column B

- a. occur within 40 km of home.  
b. is now compulsory in many provinces.  
c. should be worn for even very short trips.  
d. occurs at a speed of 65 km per hour or less.  
e. is safety-engineered and designed for ease in handling.

Exercise 5

1. Male drivers under 25 years of age are required to pay higher insurance premiums than most drivers do. Is this justified? Why or why not?

---

---

---

2. Young people see and hear better and react faster than older people. Why are they not the safest drivers?

---

---

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**LESSON RECORD FORM**0905 Health 9  
Rev. 88/04**FOR STUDENT USE ONLY**

Date Lesson Submitted \_\_\_\_\_

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## **ALBERTA CORRESPONDENCE SCHOOL**

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## HEALTH and GUIDANCE

## Safety on Highways (continued)

## E. Keeping Your Car Safe

Several times each year, and before each holiday trip, your car should be taken to the garage for servicing. The mechanic may spot certain weaknesses but his attention will be directed toward the specific things he has been asked to check. A driver should, therefore, understand his car well enough to know which checks should be made.

The serviceman will inspect, as routine work, the lubrication system for leaks, the brakes for effectiveness, the steering, the condition and air pressure of the tires. It is wise to ask that door locks be checked. Lights, too, require special attention. It is important that lights be at the proper height. Rear lights, brake lights, and signal lights should all be in perfect working condition.

The driver must make sure that visibility is good. Windshields should be kept clean and free of stickers and dangling objects. Bulky objects which interfere with the driver's vision should never be placed on the rear shelf. Never put heavy articles there either. Should the driver be forced to stop suddenly a person riding in the back seat might be injured by the displacement of the heavy object.

The driver should never allow his car to be overloaded. Too many in the front seat may interfere with the operation of the controls. Too many in the back seat may interfere with the use of the rear-view mirror. The driver should give his undivided attention to his driving. He should not allow conversation with passengers, the radio, or other distractions to interfere.

Emergency equipment such as flares, flashlight and chains should always be carried.

## F. Highways and Safety

Some roads surfaces are firm but others may be treacherous. Wet spots on a dry road are dangerous. Patches of ice, snow, sand, or wet leaves must be watched too. Sometimes the crown in the middle of the road is too high. This causes your car to tilt. To offset this danger you must reduce your speed. Many curves are difficult to judge. Some are very sharp and lack the proper banking. The wise thing to do is to slow down and approach all curves with caution. You invite trouble if you apply the brakes after you enter a curve, as this throws the weight of the car toward the outside arc of the curve.

## HEALTH and GUIDANCE

The soft shoulders just off the main paved area should be avoided. They present serious hazards. Should you be forced onto them do not apply the brakes heavily. Keep the car going straight ahead and slow down gradually.

There are other highway hazards. Included in these are ditches along the sides of the roads, curves or cliffs without guard rails, and faded lane lines in the middle of the road.

Highway signs and speed limits are placed at strategic spots. These signs should be carefully observed.

Night driving is particularly hazardous. It appears to be seven or eight times as dangerous to drive in the country at night as it is to drive on busy city streets by day. The night danger is partly due to drivers being blinded by oncoming headlights. Reduce your speed when driving at night. When meeting traffic always dim your lights.

Under adverse weather conditions such as ice, fog, or sleet, speed should be greatly reduced.

### G. An Expert Driver

The expert driver moves in and out of traffic without cutting in on others or stealing the right of way from anyone. He anticipates turns at intersections and chooses the lane nearest the direction in which he wishes to turn. Thus he avoids cutting in in front of another driver. If he is driving slowly he keeps in the righthand lane. He does not honk the horn in a traffic jam. Neither does he shout at drivers who get in his way.

The good driver rounds curves at a reduced speed and accelerates when he has made the curve. He gives the proper signals that will be visible to drivers behind him.

When visibility becomes poor because of darkness, fog, or rain the good driver at once reduces his speed.

The good driver never quibbles over the right of way because he considers safety of greater importance. At important highway intersections he stops whether or not there is a stop sign there. He does not follow other cars too closely.

## HEALTH and GUIDANCE

Special attention should be given to intersections, particularly the so-called blind crossings where oncoming traffic cannot be seen. Slow down and let other cars at intersections have the right of way even though it may legally be yours. Demanding the right of way at crossings causes many serious accidents.

### Ten Ways to Recognize a Good Driver

He gives correct signals for lane changes, turns, and stops.

He obeys speed limits.

He stops completely at stop signs.

He drives in the proper lane and turns in the proper lane.

He observes passing lanes and no-passing zones.

He yields right of way to pedestrians and observes mid-block crosswalks.

He stops when approaching standing school buses and waits until it is safe to proceed.

He exercises special caution at railway-grade crossings.

He refuses to drive after drinking.

He drives defensively, anticipating what other drivers or pedestrians may do.

### H. The Responsibility of the Individual Driver

The slaughter on our highways must be stopped. Traffic regulations and enforcements can only help to reduce the number of fatalities. The final responsibility for safety lies with the individual driver.

Good driving consists of self-control and car-control. A good driver voluntarily observes traffic regulations. He has a "give-and-take" attitude. He recognizes his responsibility to himself and to others. He keeps his car under control at all times for he has mastered the techniques of driving. The good driver expects the other driver to make mistakes and is prepared to meet any emergency. He does not allow himself to become upset when a mistake is made.

## HEALTH and GUIDANCE

Almost half the fatal accidents occur on Saturdays and Sundays. The safest days to be on the highway are Tuesday, Wednesday, and Thursday. This, however, is not the case if a holiday falls in the middle of the week. An increase in accidents accompanies an increase in traffic. Plan to drive when the streets and highways are not congested.

No doubt you would like to become a safe driver. You will need to be constantly on the alert to avoid accidents. You will conform to all rules and regulations designed to protect drivers, passengers, and pedestrians. While at the wheel you will devote your entire attention to driving.

## HEALTH and GUIDANCE

Exercise 1

Answer in sentences.

1. What would you consider a suitable maintenance schedule for a family car? Why? \_\_\_\_\_  
\_\_\_\_\_
2. Why is it important for the owner of a car to understand the mechanical workings of his car? \_\_\_\_\_  
\_\_\_\_\_
3. What special checks should be made before long trips? \_\_\_\_\_  
\_\_\_\_\_
4. List the things that can be done to make sure that the driver has good visibility. \_\_\_\_\_  
\_\_\_\_\_
5. The driver of a car is responsible for the safety of the people in his car. What can he do to discharge this responsibility? \_\_\_\_\_  
\_\_\_\_\_
6. Name three pieces of emergency equipment that should be carried in a car and tell the importance of each.
  1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_

## HEALTH and GUIDANCE

8. The driver should never allow \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_.
9. The driver should give \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_.
10. Emergency equipment \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_.

Exercise 2      Highways and Safety

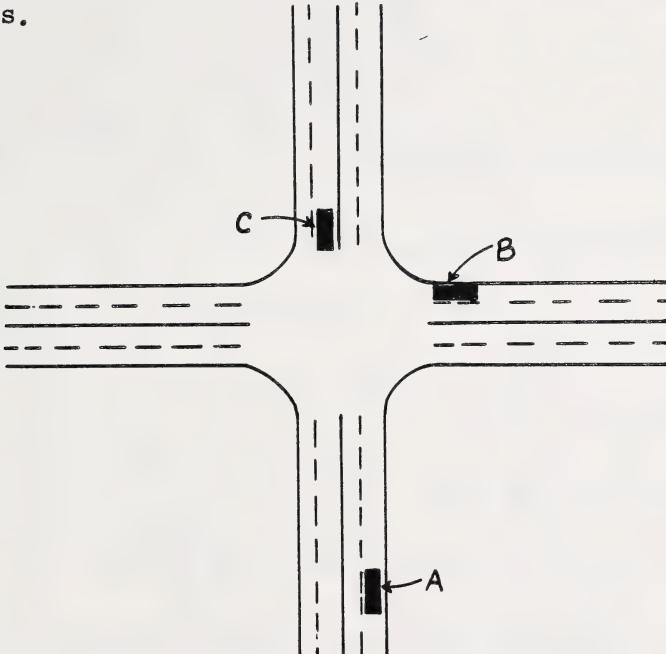
Answer T if the statement is true; answer F if the statement is false. Use the space provided.

- \_\_\_\_ 1. Some road surfaces are treacherous.
- \_\_\_\_ 2. Wet spots on a dry road are not dangerous.
- \_\_\_\_ 3. Many curves are difficult to judge.
- \_\_\_\_ 4. You invite trouble if you apply the brakes after you enter a curve.
- \_\_\_\_ 5. The soft shoulders just off the main paved area should be avoided.
- \_\_\_\_ 6. Should you be forced onto a shoulder apply the brakes heavily.
- \_\_\_\_ 7. Highway hazards include ditches along the sides of the road, curves or cliffs without guard rails, and faded lane lines in the middle of the road.
- \_\_\_\_ 8. Highways signs and speed limits should be carefully observed.
- \_\_\_\_ 9. Under adverse driving conditions such as ice, fog, or sleet, speed should not be reduced.

## HEALTH and GUIDANCE

Exercise 3

1. The diagram below shows an uncontrolled intersection of two four lane roads.



- (1) You are the driver of car A and are on your way to the parking lot in the upper left of the diagram. On the diagram draw the route you will follow to reach the parking lot.
- (2) As the driver of car B you arrive at the intersection at the same time as car C.

Which car has the right-of-way? \_\_\_\_\_

Why is this so? \_\_\_\_\_  
\_\_\_\_\_

What should you do as the driver of car B?

\_\_\_\_\_

2. Assuming your reaction time is one half a second, how far will your car travel at 50 km. per hour before you can begin braking?
- \_\_\_\_\_

## HEALTH and GUIDANCE

Exercise 4 Responsibility of the Individual Driver

Fill in the blanks with suitable words chosen from your notes.

The \_\_\_\_\_ on our highways must be stopped. Traffic \_\_\_\_\_ and \_\_\_\_\_ can only help. The final responsibility for safety lies with the \_\_\_\_\_

Good driving consists of \_\_\_\_\_ and \_\_\_\_\_. A good driver \_\_\_\_\_ observes traffic regulations. He has a " \_\_\_\_\_" attitude. He recognizes his \_\_\_\_\_ to himself and to others. He keeps the car under \_\_\_\_\_ at all times for he has mastered the \_\_\_\_\_ of driving.

The good driver expects the other driver to make \_\_\_\_\_ and is prepared to meet any \_\_\_\_\_. He does not allow himself to become \_\_\_\_\_ when a mistake is made.

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0905 Health 9

Rev. 88/04

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## HEALTH and GUIDANCE

## Safety in Swimming

## A. Values and Hazards in Swimming

From the physical, therapeutic, social safety, and recreational viewpoints, physical-education experts rate swimming as the most valuable of all activities on the sports field. Every year millions of persons enjoy swimming in oceans, lakes, and rivers. Indoor pools in schools and recreation centres make swimming a year-round sport. Swimming uses most of the body's muscles and develops grace and strength. It also increases the functioning power of the heart, the lungs, and the digestive organs. Besides its value as a recreation and sport, swimming has another high value -- that of lifesaving. If a person becomes a proficient swimmer, he then has an emergency personal safeguard and the means of saving the lives of others.

Although swimming is a wonderful sport, it has many drawbacks. The water itself may be contaminated with disease germs. Near large cities, rivers and streams may be polluted. At times certain beaches along the largest inland lakes and along the ocean are dangerously infested. Persons troubled with sinus disorders are advised by their doctors to stay out of the water. For some people swimming seems to aggravate these conditions. Long underwater swims and much high diving should be eliminated. Strokes, such as the crawl, in which the head is kept mostly under water should be modified. It is most important that all swimmers learn to breathe properly and inhale through the mouth only.

The National Safety Council reports that there are more accidental deaths from drownings than from any other cause except those involving motor vehicles. The death rate from drowning is highest among teen-age boys and girls and those up to twenty-four years of age.

Many drownings could be prevented if people in difficulty would avoid panic and observe a few precautions. The inexperienced non-swimmer loses his head and attempts to climb out of the water by thrashing his arms and legs about wildly. Such struggles tend to force him under and make him swallow or even inhale water. The swimmer could save himself by remaining in a standing position and inhaling only when his head is out of water, or, he could lie flat on his back and remain in a floating position until help arrives.

## HEALTH and GUIDANCE

Many drownings of experienced swimmers are due to cramps. If the cramps occur in the feet, legs, or arms, roll into a floating position and massage the cramp, then continue swimming. To avoid abdominal cramps which place the swimmer in a most difficult position, avoid entering the water for at least an hour after eating and two hours, if the meal has been a heavy one.

If you are really in difficulty, call immediately and loudly for assistance.

### B. Safety in the Swimming Pool

In a swimming pool, desirable behavior would exclude running on slippery deck surfaces, or scuffling, or rough play on the deck or in the water. Ducking others and playing tag would also be considered undesirable.

The lifeguard enforces the following rules:

1. Weak swimmers and non-swimmers must remain in shallow water.
2. No diving in shallow water.
3. Swimmers must stay away from diving boards.
4. Life-saving devices, such as body hooks, poles, ring buoys and life lines must be kept in good repair.
5. The attendance record must be checked at the end of each session to see that all swimmers have left the pool.

### C. Safety in Ocean Swimming

Surf swimming is hazardous. If the water is too cold or the surf too heavy for safety, the lifeguard will say so. He will point out particular hazards such as rip-tides, heavy undertow, submerged rocks, pilings or dangerous currents running under piers. Each of these is a major hazard in beach swimming.

Many people think they can enter the surf without fear if they are carrying a well-inflated rubber tube for protection. The Red Cross does not recommend this practice for the poor swimmer. Powerful ocean breakers may tear the swimmer loose from his protective apparatus. Should the surf carry the swimmer beyond his depth, and if the apparatus should then collapse, the weak swimmer would be left entirely helpless.

## HEALTH and GUIDANCE

Quieter water is to be found just beyond the breaking surf. However, water here is usually beyond the swimmer's depth and only strong capable swimmers should venture into these waters. Here, while standing in water not above his waist, a series of heavy breakers may place the swimmer entirely beyond his depth. If the swimmer is a beginner he should not go into deep water in the surf. He should not dive into a breaker regardless of the depth of the water. There is always the danger of submerged rocks and pilings in unfamiliar waters.

On entering the water, follow the example of the lifeguard. Instead of diving headlong into an incoming breaker regardless of the depth of the water, the lifeguard wades in until he is approximately waist deep, and then he commences to swim.

If you wish to avoid being unpleasantly "churned up" when swimming through a breaker, you must learn to use the proper techniques. Hundreds of pounds of water are hurled against a person at the point of a breaking wave. When going through a breaker in water at least waist deep, or in familiar waters known to be free of submerged hazards, remember this rule, -- head into the breaker and keep your body as straight as possible. Hook your thumbs together with arms straight over your head and keep your feet together. Don't double up! Knife through the breaker!

The greatest single cause of drownings and near drownings in ocean swimming is the rip tide. A rip tide is caused by two lines of waves coming into the shore at an angle. When the waves meet, water piles up and rushes up the slope of the beach and digs a deep gully. The water on its return to the ocean forms a current as strong as that of a river. This current may continue a quarter of a mile or more out to sea. If a swimmer should be caught in a rip tide, he should not try to swim against this mighty current. He has two alternatives. The first is to float with the current to quieter waters and then to turn and work his way back to shore. The other alternative is to swim parallel to the shore and then to return to the beach.

**HEALTH and GUIDANCE****Safety Tips Which Apply to Beaches Everywhere**

Do not swim near rip tides. Learn to recognize them and how to combat them.

Do not overestimate your swimming ability.

Always remain near a lifeguard's lookout. Do not swim in remote places.

Do not dive into unknown waters.

Do not make long-distance swims unless a strong swimmer or a boat goes with you.

Do not use inflated play apparatus such as tire tubes, water wings, and floats. You may be carried by them into water beyond your depth.

Do not call for help unless you are actually in difficulty. If you do need help call immediately and loudly for assistance.

Do not take dares.

Do not go to the assistance of a lifeguard unless he asks for your help. He might have to rescue two persons instead of one.

Water safety depends on many skills. These include a knowledge of basic water safety rules, the ability to swim, and training in lifesaving. Every year about 6,500 persons drown in the United States and about 1,000 in Canada. Many accidents would not happen if more people knew how to swim and how to behave in or near water.

**A Few Water Safety Rules**

Learn to swim.

When boating always carry life preservers.

If a boat capsizes, cling to it until help comes.

Obey rules posted at beaches and pools.

Do not enter water during a storm.

Never leave a small child alone in or near water. A baby can drown in an inch of water.

**A Hint Worth Knowing**

Keep a large, empty, capped, plastic bleach bottle on the pier and in each boat. The bottle can be easily thrown to a person in difficulty and it will keep him afloat.

## HEALTH and GUIDANCE

## D. Life-Saving Procedures

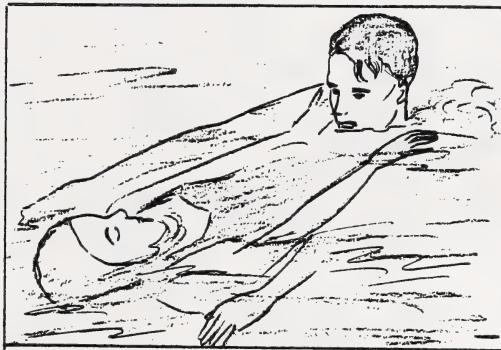
## 1. Techniques for approaching and handling a drowning person

The Red Cross suggests the slogan, "Throw. Row. Go." If the victim is within easy reach of the shore throw him a life buoy or other object that will support him temporarily. If the victim is far from shore get a boat and row out to him. If no boat is available and you must go to the victim, swim to him from behind and approach him with great care. If the victim grasps you tightly you may both drown. Offer him a rope, a stick, or even a handkerchief to grasp. Do not approach a person who is struggling violently. Tell him you cannot help him until he becomes quiet. If he does not heed your warning, wait until he exhausts himself. You can then attempt to tow him. Use one of the holds recommended by the Red Cross. With a struggling victim the "cross-chest carry" is most effective. If the victim is quiet and can help to support himself, the "tired-swimmer's carry" is the easier method.

Usually it is best for the rescuer to merely support the victim until help comes.



The Cross-Chest Carry



The Tired-Swimmer's Carry

## 2. Artificial respiration

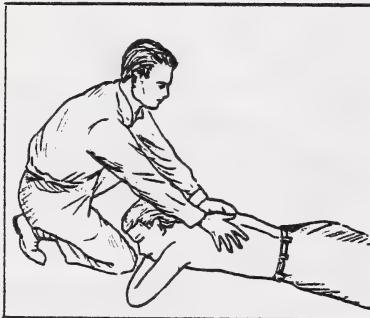
Artificial respiration is a means for getting air into the lungs of a person after drowning, gas poisoning, suffocation, and electric shock, and heart failure. To be of use, artificial respiration must be given immediately if someone stops breathing or has great trouble in breathing. Even after breathing ceases, the heart usually continues to beat for a few minutes and, in this time, the person's life may be saved by prompt application of artificial respiration.

## HEALTH and GUIDANCE

## a. The Nielsen Method

The Nielsen Method of artificial respiration is easy to learn and easy to use.

Begin by laying the victim on his stomach with the face to one side. Place his arms at right angles to his body, the upper arms extended, the elbows bent, and the hands under the cheek. Be careful to remove sand, pebbles, or other foreign matter from his mouth. Keep his tongue out. You can do all these things as you put him in position or soon afterwards. Have someone call a doctor, if that is possible.



Position 1



Position 2

Kneel on either your right or left knee, or on both, in front of the victim's head. Put your hands -- thumbs almost together and fingers spread out -- on his back just below his shoulder blades.

Rock forward and keep elbows straight. Press slowly and evenly downward on his back, adjusting your pressure to the size of his body. This empties the lungs.

## HEALTH and GUIDANCE



Position 3

Rock back, easing up on the pressure slowly. At the same time take hold of the victim's arms just above the elbows.



Position 4

Lift his arms up and toward you until you meet resistance at his shoulders. Raising the arms pulls air into the lungs. Keep your elbows straight while you do it. Then let the victim's arms fall back into place and drop your own arms.

Steadily repeat the four motions from 10 to 12 times a minute. The motion in each position should take about 1 1/2 seconds with a short pause in between.

When the victim begins to breathe on his own, be sure to keep your eye on him. Breathing may stop again. If it does, you will have to begin all over. Keep him lying down and warm until a doctor has seen him or you are sure he is all right.

The Nielsen Method of artificial respiration has been officially recommended by the Canadian Red Cross, the St. John Ambulance Association, and other national organizations.

Everyone should know how to give artificial respiration. Please learn how to use the Nielsen Method. Practise it on a friend or a member of your family. Some day you may be able to save someone's life. You may be the only person present who knows exactly what to do.

**HEALTH and GUIDANCE****b. Mouth-to-Mouth Resuscitation or Rescue Breathing**

Gain the support of intelligent bystanders. They may assist you in the following ways:

covering the patient and keeping him warm,  
calling for an ambulance or police,  
relieving you when you become tired.

In applying this method of artificial respiration to adults, the following procedure should be observed.



1. Lift the neck and tilt the head backward.
2. Hold the head tilted as far back as possible. One hand pushes the head, the other pulls the chin. Maximal tilt prevents obstruction.



3. Pinch the nostrils.
4. Take a deep breath and open your mouth as wide as you can.
5. Seal your lips on his cheeks around his mouth and blow air into victim until you see the chest rise.

## HEALTH and GUIDANCE



6. Remove your mouth and let him breathe out.
7. Continue inflations at least 10 times a minute.
8. If any air is retained in the stomach at the end of exhalation, press gently on the stomach to expel air. The presence of air in the stomach is indicated by fullness of the abdomen.

Except for very severe hemorrhage, artificial respiration should take precedence over all other first-aid measures.

Learn at least one method well. Regardless of which technique is used, a few hours of practice to develop co-ordination and "know-how" is an investment which may some day save the person whose life depends on you. And remember: Do not waste time. Start immediately and don't stop. Seconds and perseverance may save a life!



## HEALTH and GUIDANCE

Exercise 1

1. Why do experts consider swimming the most valuable sport? Give three reasons.

(1) \_\_\_\_\_  
(2) \_\_\_\_\_  
(3) \_\_\_\_\_

2. What are the dangers faced by a swimmer?

(1) \_\_\_\_\_  
(2) \_\_\_\_\_  
(3) \_\_\_\_\_

3. How does swimming rate as a cause of accidental deaths?

\_\_\_\_\_

4. What precautions can a swimmer take for his personal safety when he is swimming?

\_\_\_\_\_

\_\_\_\_\_

5. The death rate from drownings is \_\_\_\_\_ among  
\_\_\_\_\_ boys and girls.

6. If people in difficulty would avoid \_\_\_\_\_ and observe a few \_\_\_\_\_, many drownings could be prevented.

7. To avoid \_\_\_\_\_ cramps do not enter the water for at least an \_\_\_\_\_ after eating.

Exercise 2

If the statement is true, write T; if the statement is false, write F. Use the space provided.

- \_\_\_\_ 1. In a swimming pool desirable behavior would include running on slippery deck surfaces, scuffling or rough play on the deck or in the water.
- \_\_\_\_ 2. Ducking and playing tag are considered to be desirable behavior.

(e)

## HEALTH and GUIDANCE

- 3. Weak swimmers and non-swimmers should remain in shallow water.
- 4. Swimmers should stay away from diving boards.
- 5. Life-saving devices such as body hooks, poles, ring buoys and life lines must be kept in good repair.

Exercise 3 Safety in Ocean Swimming

Match the predicates in Column B with the subjects in Column A to make complete true sentences.

Column A	Column B
— Surf swimming	a. should not carry inflated apparatus.
— The lifeguard	b. may venture into quieter waters beyond the breaking surf.
— Poor swimmers	c. will point out particular hazards.
— Strong capable swimmers	d. is always present in unfamiliar waters.
— The danger of submerged rocks and pilings	e. is hazardous.
— The swimmer	f. is the greatest single cause of drownings or near drownings in ocean swimming.
— Breakers	g. should not try to swim against a rip tide.
— The rip tide	h. should be knifed through.

Exercise 4

List five important safety rules which apply to beaches everywhere.

1. \_\_\_\_\_
2. \_\_\_\_\_

## HEALTH and GUIDANCE

3. \_\_\_\_\_  
\_\_\_\_\_
4. \_\_\_\_\_  
\_\_\_\_\_
5. \_\_\_\_\_  
\_\_\_\_\_

Exercise 5 Life-Saving Procedures

Answer in sentences.

1. What is the slogan suggested by the Red Cross?

\_\_\_\_\_

2. What is the proper procedure

- a. if the victim is near the shore?

\_\_\_\_\_

- b. if the victim is far from shore?

\_\_\_\_\_

- c. if no boat is available?

\_\_\_\_\_

3. How should you approach a struggling victim?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. What method should be used to bring a struggling victim to shore?

\_\_\_\_\_

\_\_\_\_\_

**HEALTH and GUIDANCE**

5. What method should be used to bring a quiet victim to shore?

---

---

6. If help is near what should the rescuer do?

---

---

**Exercise 6      Mouth-to-Mouth Resuscitation Method**

In the use of mouth-to-mouth resuscitation, briefly outline the 7 steps to be taken.

1. \_\_\_\_\_

---

2. \_\_\_\_\_

---

3. \_\_\_\_\_

---

4. \_\_\_\_\_

---

5. \_\_\_\_\_

---

6. \_\_\_\_\_

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7. \_\_\_\_\_

---

## HEALTH and GUIDANCE

Exercise 7

Give one good reason for each of the following rules.

1. Do not use inflated play apparatus when swimming in oceans or lakes.

---

---

2. Remain near a lifeguard's lookout.

---

3. Do not call for help unless you are in trouble.

---

4. Stay away from diving boards when you are swimming.

---

5. Do not dive in unknown waters.

---

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# LESSON RECORD FORM

Health and Guidance 9

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Correspondence Teacher

For use of student

File No.

Lesson No.

Date submitted

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**LESSON RECORD FORM**

0905 Health 9

Rev. 88/04

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## HEALTH and GUIDANCE

### Unit VI - Group Action for Health

#### The Role of the Community

##### A. Community Health Problems

Public health is everybody's concern. The term public health includes all community efforts to prevent disease, prolong life, and promote happiness through mental and physical well-being. Many public health problems relate directly to the community. Therefore, a city or local health department can deal more effectively with these problems than a larger organization can.

We possess scientific knowledge and we have skilled professional medical people who have the ability to fight disease. However, good health requires more than effective treatment. Prevention of disease and the promotion of health are of prime importance. Private citizens, public officials, technicians, nurses, and doctors must work in close co-operation if the desired goals are to be reached. Group action is essential.

For many years, work in the field of environmental health was related to community health sanitation, such as pure water, milk, and food supplies, garbage and sewage disposal, etc. Increasing industrialism, however, has imposed new responsibilities calling for new techniques in public health engineering and sanitary services. Air pollution, noise control, and radiation are emerging as major environmental health problems. Co-ordinated efforts of communities and governments at local, provincial, and federal levels are needed in planning effective control measures.

Health to-day plays a large part in the affairs of every community. Through taxation, the ratepayers support public health departments which deal with the health of all of us. The government must, therefore, assume the responsibility for organizing to meet community health problems. It is the duty of well-informed, public-minded citizens who see the need for new health legislation to act as leaders in arousing public interest. By group action communities which have legitimate health problems can demand legislation and get it. The citizens of Chicago, that city of grime and smoke, demanded clean air. In due time, satisfactory laws were passed and enforced.

New health problems continue to crop up. Mankind solves one problem, only to be faced with another, for marked environmental changes follow in the wake of progress.

## HEALTH and GUIDANCE

If new laws for the cleanliness and safety of factories, businesses, or homes are required these can also be attained by legislation. If parks, recreational areas and facilities are needed these too may be had. Community interest must first be aroused. Speakers may be invited to give talks, available literature on the problem may be distributed, letters may be written to the editor of the local papers, etc. Group action coupled with determination should bring the desired results.

If a new problem is emerging for which no literature is available, health departments may be asked to provide the necessary information.

Health Education should teach citizens that in our democratic country the health of the community is their responsibility.

### B. Health Organization in Your Province

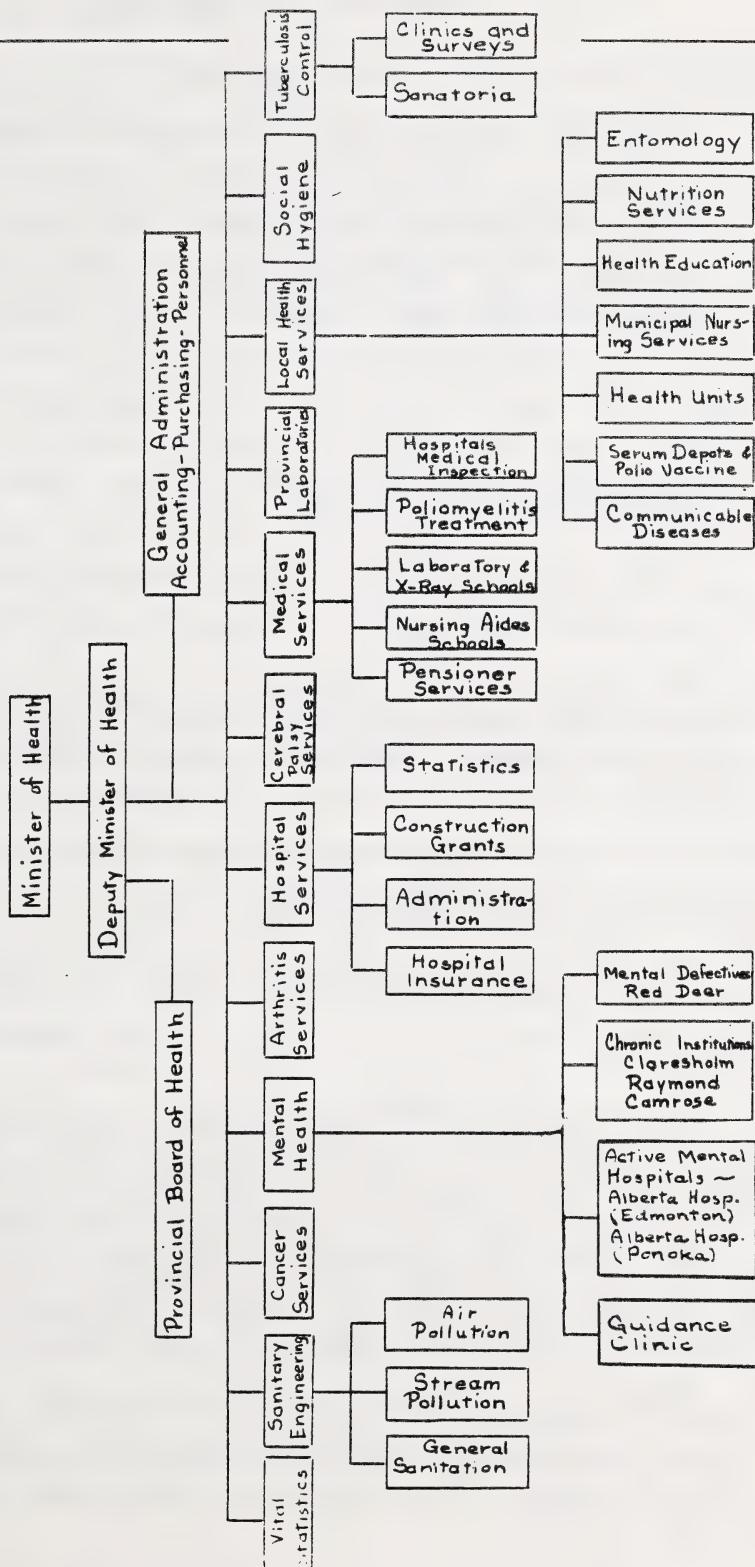
Although the federal government carries out many important activities that improve the health of citizens in all parts of Canada, most of the direct services are centred in the provincial health department and local health units. This is a wise arrangement for Canada is a vast country and health problems vary from one part of the country to another. The provincial governments, with the help of local health departments can keep in close touch with the health of the people. They can work out programs that will fit the needs of people in particular areas.

Local health departments are part of the government of cities, towns, counties, and municipalities. These local departments work closely with the provincial health department.

The provincial health department carries out its services through a number of branches or divisions which represent some special aspect of health. In order to understand the work of the provincial health department you need to know some of the important divisions or branches within the department. Please study the chart.

Department of Public Health - Alberta

## DIVISIONAL ORGANIZATION CHART



## HEALTH and GUIDANCE

### C. Health Organization in Your Community

It is easy for a large city to safeguard and promote health. The formation of Health Units, however, makes it possible for the more scattered portion of the population to enjoy adequate health services. A Health Unit is a modern local health department staffed by qualified health workers serving one or more towns and the surrounding areas. The staff normally consists of a medical officer, a number of public health nurses, one or two sanitary inspectors. The Health Unit may also employ a dentist, a dental hygienist and an assistant. These units are organized by the provincial government at the request of the ratepayers. The control of the services offered by the unit lies with the people themselves. In certain areas particular services may be required. These, along with the basic services, are provided.

Health Units do not give medical treatment except in emergencies. Their work consists mainly of giving expert advice on the prevention of disease and the promotion of health.

When a Municipal Nursing Service exists within a health unit the municipal nurse carries out a health program under the supervision of the medical officer, and provides, in addition, an emergency treatment service for local residents.

### Health Services in Your Community

#### A. Maternal and Child Health Programs

Pre-natal and post-natal instruction is given to mothers. Visits are made to the home to advise the mother in the care of the infant. Child health conferences are held in suitable centres to which mothers may go to obtain advice in child care.

School children are examined before being admitted to school. At the request of the parents, teacher, or medical officer, those in poor health may again be examined. The necessary measures are taken for the control of communicable diseases among school children and an immunization program is carried out. Advice is given on the sanitation of schools. Health Education is carried out by means of films and talks suitable for children. By these methods children are taught to value good health and to take care of their own health.

Health Units are authorized to establish dental services for the benefit of children up to sixteen years of age. These services may include examinations, treatment of selected age groups and education in dental hygiene. In outlying areas mobile dental units make these services possible.

## HEALTH and GUIDANCE

Lectures are given and films are shown on nutrition and advice regarding nutritional needs is given in the course of child conferences and home visits.

Programs of health education are carried out by the Health Unit. The Health Education Section of the Public Health Department assists Health Units in these programs and supplies them with films and literature to enable them to instruct the parents in taking the best possible care of their own health and the health of their children.

### B. Environmental Sanitation

Inspections are made and advice is given on water supplies, milk supplies, meat and foods. Sewage and garbage disposal are also supervised. Air pollution, noise control, and radiation are emerging as health problems.

### C. Communicable Disease Control

An immunization program offers immunization against smallpox, diphtheria, whooping cough, tetanus, and poliomyelitis. When necessary, immunization may be had against various other diseases, for example, typhoid fever.

The unit strives to control communicable diseases by detection, and by controlling sources of infection. Routine laboratory tests are made. Advice is given regarding the isolation of patients and the quarantine of those with whom they have been in contact. The Health Unit acts as a serum centre for the community.

### D. Special Services

Mental health is one of Canada's biggest public health problems. Mental health clinics are held regularly in city centres while rural areas are served by travelling clinics from time to time in various places. At these clinics advice is available to parents, teachers, and other individuals who are in need of guidance. Counselling may be obtained if mental or emotional problems among their children or other members of their families are creating difficulties. Through public addresses, radio programs and the distribution of educational literature, a general education program is carried out.



## HEALTH and GUIDANCE

Exercise 1 Community Health Problems

Fill in the blanks with suitable words chosen from your notes.

Public Health is everybody's \_\_\_\_\_ The term public health includes all \_\_\_\_\_ efforts to \_\_\_\_\_ disease, \_\_\_\_\_ life, and \_\_\_\_\_ happiness and well-being. Many public health problems are \_\_\_\_\_ related to the community. Good health requires more than effective \_\_\_\_\_. \_\_\_\_\_ of disease and the \_\_\_\_\_ of health are of prime importance.

Exercise 2

Answer T if the statement is true; answer F if the statement is false. Place the letter of your choice in the space provided.

- \_\_\_\_\_ 1. For many years work in the field of environmental health was related to community health sanitation.
- \_\_\_\_\_ 2. Because of increasing industrialism new techniques in public health engineering are not needed.
- \_\_\_\_\_ 3. Air pollution, noise control and radiation are emerging as major environmental health problems.
- \_\_\_\_\_ 4. Health today does not play a large part in the affairs of every community.
- \_\_\_\_\_ 5. Through taxation ratepayers support public health departments.
- \_\_\_\_\_ 6. The government assumes responsibility for organizing to meet community health problems.
- \_\_\_\_\_ 7. It is not the duty of well-informed and public-minded citizens to act as leaders to arouse interest in health problems.
- \_\_\_\_\_ 8. By group action communities can demand needed legislation and get it.
- \_\_\_\_\_ 9. Mankind solves one problem only to be faced with another.
- \_\_\_\_\_ 10. Health education should teach citizens that in our democratic country the health of the community rests with the people.

**HEALTH and GUIDANCE****Exercise 3      Health Organization in Your Province**

Match the predicates in Column B with the subjects in Column A.  
Place the letter of your choice in the space provided.

Column A	Column B
_____ The federal government	a. has a Department of Public Health.
_____ Most of the direct services to the Canadian people	b. carries out its services through a number of branches.
_____ Every provincial government	c. are received through the provincial governments.
_____ Local health departments	d. are part of the government of cities, towns and municipalities.
_____ The provincial health department	e. carries out many activities in all parts of Canada.

**Exercise 4      The Department of Public Health (Chart)**

Answer the following questions in sentences.

1. Who is at the head of the Provincial Department of Health?

---

2. What services are available from Local Health Departments?

---

---

---

3. Which department is responsible for General Sanitation?

---

4. Under which service are Guidance Clinics administered?

---

## HEALTH and GUIDANCE

Exercise 5

Write a paragraph of four or five sentences using as your topic sentence, "Health Units are organized by the provincial government at the request of the ratepayers." Do not copy directly from the notes. Express your ideas in your own words.

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Exercise 6

Complete the following sentences.

1. Pre-natal and post-natal instruction is given \_\_\_\_\_.

---

2. School children are examined \_\_\_\_\_

---

3. The necessary measures are taken for the control \_\_\_\_\_

---

4. Health Units are authorized to establish dental services for \_\_\_\_\_

---

---

5. Advice regarding nutritional needs \_\_\_\_\_

---

---

**HEALTH and GUIDANCE**

6. Programs on Health Education are carried out by \_\_\_\_\_
7. Inspections are made and advice is given on water supplies, \_\_\_\_\_  
\_\_\_\_\_
8. Sewage and garbage disposal are \_\_\_\_\_
9. An immunization program offers immunization against \_\_\_\_\_  
\_\_\_\_\_
10. The Health Unit strives to control communicable disease by detection  
and by \_\_\_\_\_  
\_\_\_\_\_
11. Mental health clinics are held \_\_\_\_\_  
\_\_\_\_\_
12. The Health Unit strives to control communicable diseases \_\_\_\_\_  
\_\_\_\_\_

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## HEALTH and GUIDANCE

### Other Health Services

#### Voluntary Assistance Organizations

It is a recognized fact that providing health care requires the aid of voluntary organizations as well as governmental legislation and the services of the medical team. Voluntary organizations have pioneered in many health fields. The Canadian Tuberculosis Association has been in existence for more than fifty years; the Victorian Order of Nurses was set up by royal charter before the turn of the century. The Canadian Mental Health Association and the Canadian National Institute for the Blind were established in 1918. The Canadian Cancer Society became active in 1938; the Canadian Arthritis and Rheumatism Society with branches in the province was founded in 1948. There are many other organizations with special fields of activity. Some of these are the Canadian Council for Crippled Children, the Canadian Red Cross Society, the St. John Ambulance Association and the Canadian Diabetic Association.

The Health League of Canada, which has been operating since 1921, attacks every phase of disease and promotes health in community, home and school. Each year the League declares a National Health Week in an effort to arouse the interest of Canadians in maintaining the highest possible standard of health throughout their country.

Life insurance companies have played their part in promoting health standards. Some firms have distributed vast quantities of health literature. Some have provided policy holders with a visiting nurse service. Many companies have made generous financial contributions to health agencies which are concerned with the control of tuberculosis, cancer, poliomyelitis, and other diseases.

On a world-wide scale concerted efforts are being made for control of infectious diseases. The World Health Organization of the United Nations is moving toward promotion of health and the conservation of life in underdeveloped areas. In this task Canada has played an important role.

#### Alberta Health Care Insurance Plan

Effective July 1, 1969, all residents of Alberta were required to register under the Alberta Health Care Insurance Plan, a compulsory medical and health insurance plan. A year later, July 1, 1970 Alberta residents were given the option of continued coverage under the plan, or withdrawal from it. However, the federal Medical Care Act prevents private insurance companies from offering insurance for physicians' services; hospital and related care may be provided by them.

## HEALTH and GUIDANCE

The basic health services provided under the plan are as follows:

1. All medical services provided by General Practitioners and Specialists (surgeons, radiologists etc.) which are medically required by a resident or his dependents.
2. Oral surgery performed by dental surgeons for injury to or a disease of the jaw restricted to certain specified procedures. This service does not include routine dental treatment.
3. Optometric services limited to \$12.50 for each refraction of the eyes - not more than once every year. This does not pay for the fitting or cost of the glasses.
4. Podiatric services and appliances in accordance with the agreed schedule of fees.
5. Osteopathic services at \$5 per visit up to \$100 a year.

Note: Benefits payable for podiatric and osteopathic services combined are limited to a total of \$100 a year for single residents and \$150 a year for residents with one or more dependents.

6. Chiropractic services, with \$6 for each visit and not exceeding \$10 in X-rays for each disability with maximum coverage of \$100 a year for single residents or \$150 for residents with one or more dependents.

Extra services such as ambulance, hospitalization, drugs, prosthetic appliances, physiotherapy and naturopathy are available from the Alberta Blue Cross Plan or various insurance companies.

### Availability

Prepayment of medical services is available in three categories on the individual basis --

one person  
two persons  
family of three or more persons.

Prepayment is also available on a group basis through your employer.

## HEALTH and GUIDANCE

Premiums for the Alberta Health Care Insurance plan are \$69 yearly in 1971 for single persons and \$138 for couples and families. Subsidies reduce the premiums to \$24 for single persons and to \$48 for families with no taxable income in the previous year; to \$36 for single persons whose taxable income does not exceed \$500; and to \$72 for families whose combined taxable income does not exceed \$1000.

### Eligibility for Premium Subsidy

A resident of Alberta is a person who has lived in Alberta 12 months of the preceding 24 months.

The Alberta Government will pay a portion of the premium for residents in defined lower income levels.

Those who are eligible for government help (subsidization) must complete, with the insurance firm of their choice, a special form which is available through the insurance company. A folder which gives a list of approved health insurance firms, is available at Alberta government offices, any health insurance office, or at the office of any physician.

Those applying for non-subsidized enrolment under the Alberta Health Care Insurance Plan may enrol directly with the insurance company of their choice.

### Alberta Hospitalization Benefits Plan

Any person who is legally entitled to reside in Canada and who makes his home and is ordinarily present in the Province is entitled to benefits provided by the Alberta Hospitalization Benefits Plan. Hospital benefits include bed accommodation at standard ward level; meals; necessary nursing service; laboratory, radiological and other diagnostic procedures; drugs; use of operating room, case room and anaesthetic facilities; routine surgical supplies; and radio-therapy and physiotherapy facilities, where available.

Effective July 1, 1970 a person receiving standard ward care is required to pay only a \$5 admission charge to the hospital. All daily costs formerly shared by patient and government are covered by the Alberta Hospitalization Benefits Plan and the Alberta Health Care Insurance Plan, providing the patient is registered under and contributes to the latter plan.

## HEALTH and GUIDANCE

When the patient requests semi-private or private accommodation, he pays the difference in charges. A person not having coverage under the Alberta Health Care Insurance Plan must pay the entire cost of daily hospital services and benefits, which may cost from about \$30 to \$40 per day.

The province of Alberta pays the \$5 admission (coinsurance) fee for the following persons: those whose hospitalization has been approved by a Cancer Clinic of the Department of Health and Social Development, those who have been afflicted by poliomyelitis and are receiving approved hospital treatment, and children approved for admission to multiple handicapped children's units.

### The Alberta Blue Cross Plan

#### a. The Plan

The Alberta Blue Cross Plan is a non-profit plan sponsored by the hospitals through their own hospital association. The Blue Cross principle for the prepayment of bills was first introduced to Alberta in 1934 to provide a means of removing the financial burden of unexpected hospital bills.

#### b. Benefits

Blue Cross contracts provide:

payment of the coinsurance required to be paid by all residents of Alberta when hospitalized;

payment of charges incurred when semi-private or private rooms are occupied depending on the subscriber's choice of contract.

Group and non-group contracts with Blue Cross are available. Premiums and benefits vary according to the contract selected.

## HEALTH and GUIDANCE

### The Role of the Individual in Community Health

Statesmen and writers have defined democracy in many ways. A most recent and adequate definition is that democracy is a form of government that enables the people to obtain the results they want. Democracy is not just a privilege. It is a responsibility.

In a democracy then, the individual who assumes responsibility must take an active part in the maintenance and promotion of community health. It is his duty to become well-informed on current health problems so that he can speak intelligently and arouse public interest in these matters. He should be aware that through group action the community in which he lives can get what it needs and wants, -- be it additional health services, new legislation, parks or recreational equipment. For the betterment of community health the individual, according to his abilities, must play his role as a leader or as a follower.



**HEALTH and GUIDANCE****Exercise 1      Voluntary Assistance Organizations**

Answer T if the statement is true; answer F if the statement is false. Use the space provided.

- \_\_\_\_\_ 1. It is a recognized fact that providing health care requires the aid of voluntary organizations.
- \_\_\_\_\_ 2. The Tuberculosis Association has been in existence for more than fifty years.
- \_\_\_\_\_ 3. The Canadian Cancer Society became active in 1948.
- \_\_\_\_\_ 4. The Health League of Canada which has been operating since 1921 attacks every disease and promotes health.
- \_\_\_\_\_ 5. Life insurance companies do not distribute health literature.
- \_\_\_\_\_ 6. On a world-wide scale concerted efforts are being made for the control of infectious diseases.
- \_\_\_\_\_ 7. The World Health Organization (WHO) is moving toward promotion of health and conservation of life in under-developed areas.

**Exercise 2      Medical Insurance**

Answer in sentence form.

1. What is the Alberta Health Care Insurance Plan?

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2. Who sponsors the Alberta Health Care Insurance Plan?

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3. To whom is medical insurance available?

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## HEALTH and GUIDANCE

4. Who is eligible for premium subsidy?

---

---

5. What type of application form must those eligible for premium subsidy complete?

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---

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Exercise 3      The Alberta Hospitalization Benefits Plan  
                          The Blue Cross Plan

Match the predicates in Column B with subjects in Column A to make true complete statements. Place the letter of your choice in the space provided.

- | Column A                                 | Column B                                                                         |
|------------------------------------------|----------------------------------------------------------------------------------|
| _____ The individual patient             | a. is the admission fee paid by each patient.                                    |
| _____ The coinsurance                    | b. is provided for individuals afflicted by arthritis, cancer, or poliomyelitis. |
| _____ Free standard ward hospitalization | c. is no longer responsible for daily costs.                                     |
| _____ The Blue Cross                     | d. is sponsored by the hospitals through their own hospital association.         |
| _____ The Blue Cross Plan                | e. is a non-profit plan.                                                         |
| _____ Premiums and benefits              | f. vary according to the insurance contract selected.                            |

## HEALTH and GUIDANCE

Exercise 4 The Role of the Individual in the Community

Fill in the blanks with suitable words chosen from your notes.

Statesmen and writers have defined \_\_\_\_\_ in many ways.

A most recent and adequate definition is that democracy is a form of \_\_\_\_\_ that enables the \_\_\_\_\_ to obtain the results they \_\_\_\_\_. Democracy is not just a \_\_\_\_\_. It is a \_\_\_\_\_.

In a democracy the \_\_\_\_\_ must assume an active part in the \_\_\_\_\_ and \_\_\_\_\_ of community health. It is his duty to become well-informed on current \_\_\_\_\_ so that he can speak intelligently and arouse community interest in these matters. He should remember that the community in which he lives can get what it needs and \_\_\_\_\_, -- be it additional \_\_\_\_\_, \_\_\_\_\_, or \_\_\_\_\_. The individual must play his role, according to his \_\_\_\_\_, as a leader or as a follower.



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**When you register for correspondence courses, you are expected to send lessons for correction regularly. Avoid sending more than two or three lessons in one subject at the same time.**

This lesson contains the final test. It should be written under examination conditions. Please have your supervisor (teacher, parent, responsible adult) complete the form below.

#### SUPERVISOR'S DECLARATION

When the student has completed the test and has written it under examination conditions, the teacher or supervisor should complete and sign this declaration.

I hereby certify that \_\_\_\_\_  
*(Name of Student)*

wrote the \_\_\_\_\_ test under  
*(Name of Course)*

examination conditions on \_\_\_\_\_.  
*(Date)*

Time taken to complete the test \_\_\_\_\_ hours.

Signature \_\_\_\_\_

Remember that this test will not be returned to the student, but the Lesson Record Form showing the grading received will be returned.



## HEALTH and GUIDANCE

Before you attempt these exercises review teaching notes and corrections for Lessons 1 - 14.

Exercise 1

If the statement is true write T; if the statement is false write F. Use the space provided.

- \_\_\_\_\_ 1. The special system in the body that takes oxygen from the air and makes it available to all the cells in the body is the respiratory system.
- \_\_\_\_\_ 2. External respiration takes place in the lungs.
- \_\_\_\_\_ 3. Internal respiration takes place in the body cells.
- \_\_\_\_\_ 4. The organs which supply the body with air make up the circulatory system.
- \_\_\_\_\_ 5. The length of time a person can hold his breath varies from 25 to 75 seconds.
- \_\_\_\_\_ 6. Fliers who gain altitude too fast may develop a condition known as "bends".
- \_\_\_\_\_ 7. A person feels very uncomfortable in hot, humid weather because evaporation of perspiration takes place very slowly.
- \_\_\_\_\_ 8. People feel the cold more intensely when the air is moist because cold moist air absorbs heat from the body slowly.
- \_\_\_\_\_ 9. A simple head cold can lead to more serious troubles.
- \_\_\_\_\_ 10. Tuberculosis strikes only the lungs.
- \_\_\_\_\_ 11. Salk vaccine contains killed viruses.
- \_\_\_\_\_ 12. Sabin vaccine which is taken orally contains live viruses.

## HEALTH and GUIDANCE

Exercise 2

Fill in the blanks.

1. The heart, a cone-shaped muscular organ, is about the size of a person's \_\_\_\_\_.

The heart is divided into two separate parts by a vertical wall called the \_\_\_\_\_.

Each side of the heart consists of a \_\_\_\_\_-walled upper chamber called an \_\_\_\_\_ and a \_\_\_\_\_-walled lower chamber called a \_\_\_\_\_. One-way valves \_\_\_\_\_ the auricles and ventricles.

2. \_\_\_\_\_ carry blood away from the heart.

\_\_\_\_\_ carry blood to the heart.

\_\_\_\_\_ connect arterioles and venules.

3. \_\_\_\_\_ cells deliver oxygen to the body cells.

\_\_\_\_\_ cells fight infection in the body.

4. Endocrine glands produce \_\_\_\_\_.

Each kind of germ stimulates the body to produce chemicals known as \_\_\_\_\_.

There are \_\_\_\_\_ types of blood.

When a person receives a blood transfusion the blood he receives must \_\_\_\_\_ his blood group.

## HEALTH and GUIDANCE

Exercise 3

Check the correct statements by placing a check ( ✓ ) mark.

- The blood            carries oxygen from the lungs to the body tissues.  
                       carries food to the body tissues.  
                       carries oxygen to the lungs.  
                       carries carbon dioxide from the body cells to  
                    the lungs.  
                       carries waste products from the body cells to  
                    excretory organs.  
                       carries antibodies and bacteria killing substances  
                    to all parts of the body.  
                       distributes hormones and other chemicals.  
                       maintains normal body temperature.

Exercise 4

Answer the questions in sentence form.

1. The continued rise in the white cell count is a symptom of what disease?

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2. Is a heart murmur always an indication of a serious condition?

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3. Why should older people have regular blood pressure checks?

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## HEALTH and GUIDANCE

4. To stop bleeding from an artery where is pressure usually applied?

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5. When a cardiac arrest occurs what emergency treatment is given?

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6. What is an electrocardiogram?

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## HEALTH and GUIDANCE

Exercise 5

Match the predicates in Column B with the subjects in Column A.  
Write the letter of your choice in the space provided.

Column A	Column B
_____ The nervous system	a. must have a proper supply of hormones in his body.
_____ The unit of nerve structure	b. are responsible for the abnormal size of giants and midgets.
_____ The sciatic nerve	c. are chemical regulators of the body.
_____ Reflex actions	d. influences the rate at which food is burned.
_____ The central nervous system	e. is the co-ordinator of all the activities in the body.
_____ The autonomic nervous system	f. destroy the cell bodies in motor nerves.
_____ Polio viruses	g. is known as diabetes.
_____ A fracture of the skull or vertebral column	h. is the neuron.
_____ The endocrine glands	i. controls the digestive, the respiratory, and circulatory systems.
_____ Hormones	j. may damage the brain or spinal cord.
_____ A normal healthy person	k. pour their hormones directly into the blood stream.
_____ Thyroxine, secreted by the thyroid,	l. is a good example of a large nerve in the body.
_____ Disturbances in the pituitary gland	m. prepares the body to meet emergencies.
_____ A gland in the pancreas	n. consists of the cerebrum, the cerebellum, the medulla and the spinal cord.
_____ The disease caused by a lack of insulin	o. secretes a hormone known as insulin.
_____ Adrenalin	p. is a powerful chemical.
_____ Cortisone, extracted from the cortex of the adrenal gland	q. protect us from danger.

## HEALTH and GUIDANCE

Exercise 6

Write a short paragraph commenting on the following statement.  
"Highway safety depends on car care as well as the skill and attitude  
of the drivers."

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Exercise 7

Everyone should know how to give artificial respiration. The Mouth-to-Mouth is an easy method to learn.

There are eight steps to be taken in giving mouth-to-mouth resuscitation. Two have been given. Fill in the six missing steps.

1. Lift the neck and tilt the head back.

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2.

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3. Pinch the nostrils.

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4.

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5.

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6.

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7.

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8.

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(e)

## HEALTH and GUIDANCE

Exercise 8

Write a paragraph containing four or five well-planned sentences. Use as your topic sentence, "Public Health is everyone's concern". Make each sentence support your topic sentence. Your concluding sentence should be a strong one. Use your own words. Do not copy from the notes.

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Exercise 9

If the statement is true, write T; if the statement is false, write F. Use the space provided.

- \_\_\_\_ 1. The Alberta Health Care Insurance Plan is a measure to provide a prepayment plan to cover the cost of medical, surgical, and obstetrical services for all residents of Alberta, regardless of health, age, or occupation.
- \_\_\_\_ 2. Medical insurance is available to all. Those in defined lower income levels receive, from the Alberta Government, assistance in the payment of insurance premiums.
- \_\_\_\_ 3. The Blue Cross contracts provide:
  - a. the payment of the coinsurance.
  - b. payment of charges incurred when semi-private or private rooms are occupied according to the subscriber's choice of contract.
- \_\_\_\_ 4. Blue Cross premiums and benefits vary according to the contract selected.





N.L.C. - B.N.C.



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